



DRAFT ECONOMIC ANALYSIS OF  
CRITICAL HABITAT  
DESIGNATION FOR THE  
PENINSULAR BIGHORN SHEEP

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## EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the Peninsular bighorn sheep (*Ovis canadensis nelsoni*), (hereafter, "bighorn sheep"). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).
2. On October 10, 2007, the Service published a proposed rule to revise currently designated critical habitat for the bighorn sheep.<sup>1</sup> The four proposed critical habitat units cover approximately 420,473 acres located in California's Riverside, San Diego, and Imperial counties.<sup>2</sup> These proposed critical habitat units (the study area) include 24.8 percent Federal lands, 64.5 percent State lands, 9.6 percent local and private land, and 1.1 percent Tribal land, owned and managed by the Agua Caliente Band of Cahuilla Indian (the Tribe). The 4,512 acres of Tribal land within proposed critical habitat Unit 1 (San Jacinto Mountains) are expected to be managed by a Tribal Habitat Conservation Plan (HCP), and are proposed for exclusion. In addition, the private, U.S. Bureau of Land Management, and California Department of Fish and Game land within two of the four proposed critical habitat units, San Jacinto Mountains (Unit 1) and North Santa Rosa Mountains (Unit 2A), (19,211 acres) is being considered for exclusion, as these areas are covered by the draft Coachella Valley Multiple Species HCP. Exhibit ES-7 provides an overview of the location of the proposed critical habitat units.<sup>3</sup> Exhibit ES-8 displays the distribution of land ownership within the study area. Appendix B provides detailed maps of the proposed critical habitat units.
3. The Key Findings highlighted below and in Exhibit ES-1 summarize the results of the economic analysis. Detailed pre-designation baseline, post-designation baseline, and incremental impacts are presented by unit in Exhibits ES-2 through Exhibit ES-4. These impacts are presented separately for areas proposed for designation, proposed for exclusion, and considered for exclusion.
4. The activities considered in the study are ranked by post-designation baseline impacts in Exhibit ES-5 and by incremental impacts in Exhibit ES-6. Exhibits ES-9 and ES-10 provide a geographic presentation of the magnitude and composition of impacts by unit

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<sup>1</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Habitat for the Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*) and Proposed Taxonomic Revision; Proposed Rule, 72 FR 195, October 10, 2007.

<sup>2</sup> Note that the acreage analyzed throughout this report includes 36,000 acres that were not included in the proposed rule. The Service provided IEc with draft maps and acreage estimates for these additional areas via e-mail on May 2, 2008.

<sup>3</sup> Exhibit ES-7 also provides information on the location of essential habitat as defined by the species recovery plan, as well as the location of critical habitat designated in 2001, which was mandated for re-designation by court order in 2006.



and location for post-designation baseline and incremental impacts, respectively. Appendix C presents detailed pre-designation baseline, post-designation baseline, and incremental impacts by unit for each activity.

5. This analysis describes economic impacts of bighorn sheep conservation efforts associated with the following categories of activity: 1) habitat management, 2) development, 3) mining, 4) recreation, 5) transportation, and 6) utility construction. Administrative costs of consultations under section 7 of the Endangered Species Act (the Act) are incorporated into each chapter corresponding to the activity for which the consultation is undertaken.

KEY FINDINGS
<p>This analysis estimates baseline and incremental impacts over 20 years for three categories of land under the currently proposed rule to designate critical habitat: areas proposed for designation, areas proposed for exclusion, and areas considered for exclusion. The critical habitat unit with the highest estimated impacts varies by category.</p> <ul style="list-style-type: none"> <li>• <b>Areas Proposed for Designation:</b> For both the baseline and incremental impacts, the unit with the highest impacts is Carrizo Canyon (Unit 3). Baseline impacts are \$61.7 million, assuming a three percent discount rate and \$44.7 million assuming a seven percent discount rate. The baseline impacts in this unit are the costs for fence construction and land offset purchases in order to develop private land, and the lost tourism values due to off-highway vehicle area closures. (The South Santa Rosa Mountains unit (Unit 2B) has comparable development-related baseline impacts.) The incremental impacts for the Carrizo Canyon unit are due to the probable closure of grazing allotments; these impacts total \$527,000, assuming a three percent discount rate and \$405,000 assuming a seven percent discount rate.</li> <li>• <b>Areas Proposed for Exclusion:</b> The area covered by the Tribal HCP (Unit 1) has substantial incremental impacts (\$14.7 million assuming a three percent discount rate and \$11.3 million assuming a seven percent discount rate) because the HCP is being prepared in response to critical habitat designation. Impacts are primarily due to habitat management activities and development limitations.</li> <li>• <b>Areas Considered for Exclusion:</b> The North Santa Rosa Mountains unit (Unit 2A) has the highest baseline impacts, \$80.5 million assuming a three percent discount rate and \$55.7 million assuming a seven percent discount rate. These impacts are primarily due to land acquisition and development mitigation fees stipulated in the draft Coachella Valley Multiple Species HCP. Development of this HCP is not incremental to proposed critical habitat designation. Recreation area closure opportunity costs and construction of a bighorn sheep highway overpass also contribute to these impacts. This unit also has the highest incremental impacts (less than \$8,000 at all discount rates), which are from incremental portions of forecast habitat management and transportation consultations.</li> </ul>
AREAS PROPOSED FOR DESIGNATION
<p><b>Post-designation Baseline Impacts:</b> This analysis estimates that bighorn sheep conservation efforts over the next 20 years within proposed critical habitat areas will cost \$92.5 million (assuming a three percent discount rate), or \$67.4 million (assuming a seven percent discount rate), independent of critical habitat designation. Estimated annualized impacts are \$6.22 million (assuming a three percent discount rate), or \$6.36 million (assuming a seven percent discount rate). Conservation efforts related to development activities constitute the majority of total costs to areas proposed for critical habitat (more than 70 percent). Impacts to development activities primarily involve the purchase of land offsets and fencing construction that serve as project modifications that would allow forecast development to occur. Mining related impacts comprise 20 percent of the impacts; these impacts result from potential bighorn sheep conservation effort costs associated with mine operations similar to those that have been recommended for other mining sites in the region. Recreation and habitat management related impacts comprise about 9 percent of the impacts.</p> <p><b>Incremental Impacts of Critical Habitat:</b> The estimated incremental impacts of critical habitat designation over the next 20 years are \$411,000 (assuming a three percent discount rate), or \$306,000 (assuming a seven percent discount rate). Estimated annualized impacts are \$27,600 (assuming a three percent discount rate), or \$28,900 (assuming a seven percent discount rate). The majority of these impacts are expected to be related to habitat management conservation efforts.</p>

KEY FINDINGS (CONTINUED)
AREAS PROPOSED AND CONSIDERED FOR EXCLUSION
<p>Areas within two units are proposed for exclusion or are being considered for exclusion from critical habitat. Estimated impacts associated with these areas are:</p> <p><b>Post-designation Baseline Impacts:</b></p> <ul style="list-style-type: none"> <li>• <b>Areas Proposed for Exclusion:</b> \$499,000 assuming a three percent discount rate (\$33,500 annualized), or \$369,000 assuming a seven percent discount rate (\$34,800 annualized). These impacts are related to continued habitat management practices within areas managed by the Agua Caliente Band of Cahuilla Indians Tribe.</li> <li>• <b>Areas Considered for Exclusion:</b> \$86.3 million assuming a three percent discount rate (\$4.95 million annualized), or \$59.7 million assuming a seven percent discount rate (\$5.15 million annualized)). Impacts to habitat management (66 to 69 percent) and development (20 to 22 percent) comprise the majority of total costs, depending on the discount rate applied; transportation (7 to 8 percent), and recreation (3 to 4 percent) comprise the rest of the impacts. Habitat management costs are due to plan implementation costs and land acquisition costs in the draft Coachella Valley Multiple Species HCP. Development impacts are from mitigation fees paid to develop private land as forecast under the draft HCP. Transportation impacts are from the planned construction of a bridge for bighorn sheep (wildlife crossing) over State Route 74. Note that the estimates related to species management for this area are forecast over a thirty-year period because information is available in the Coachella Valley Multiple Species HCP that spans 30 years.</li> </ul> <p><b>Incremental Impacts of Critical Habitat:</b></p> <ul style="list-style-type: none"> <li>• <b>Areas Proposed for Exclusion:</b> \$11.3 million assuming a three percent discount rate (\$758,000 annualized), or \$8.31 million assuming a seven percent discount rate (\$785,000 annualized)). Costs are composed of habitat management (78.4 percent) and development (21.3 percent), and are related to the implementation of a draft Tribal HCP that is being prepared in response to potential critical habitat designation.</li> <li>• <b>Areas Considered for Exclusion:</b> \$8,850 assuming a three percent discount rate or \$7,920 million assuming a seven percent discount rate. These impacts represent the incremental portion of forecast section 7 consultations.</li> </ul>

## EXHIBIT ES-1 SUMMARY OF IMPACTS (2008 - 2027), 2007\$

IMPACT	3% DISCOUNT RATE	7% DISCOUNT RATE
<b>BASELINE</b>		
<b>PROPOSED CRITICAL HABITAT</b>		
Total Post-Designation Baseline Impacts	\$92.5 million	\$67.4 million
Annualized	\$6.22 million	\$6.36 million
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
Total Post-Designation Baseline Impacts	\$499,000	\$369,000
Annualized	\$33,500	\$34,800
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
Total Post-Designation Baseline Impacts	\$86.3 million	\$59.7 million
Annualized	\$4.95 million	\$5.15 million
<b>INCREMENTAL</b>		
<b>PROPOSED CRITICAL HABITAT</b>		
Total Incremental Impacts	\$411,000	\$306,000
Annualized	\$27,600	\$28,900
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
Total Incremental Impacts	\$11.3 million	\$8.31 million
Annualized	\$758,000	\$785,000
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
Total Incremental Impacts	\$8,850	\$7,920
Annualized	\$595	\$747
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan. These estimates include conservation impacts for land acquisition projected through 2037.		

6. Exhibit ES-3 presents the post-designation baseline impacts by unit, for each category: proposed for designation, proposed for exclusion, and considered for exclusion. Carrizo Canyon (Unit 3) has the largest post-designation baseline impacts of the areas proposed for critical habitat. North Santa Rosa Mountains (Unit 2A) has the largest baseline impacts of the areas considered for exclusion.
7. Exhibit ES-4 presents the incremental impacts by unit, for each category: proposed for designation, proposed for exclusion, and considered for exclusion. Carrizo Canyon (Unit 3) has the largest incremental impacts of the areas proposed for critical habitat. These impacts are primarily due to the potential effect of critical habitat on mining activity in

that unit. The Tribal land within the San Jacinto Mountains unit (Unit 1) has the second largest total impact; these costs are from the Tribal HCP, which is being developed in response to pending critical habitat designation.

8. Exhibit ES-5 ranks the post-designation baseline impacts by activity, and at three and seven percent discount rates. For areas proposed for designation, development has the highest impact, at more than 70 percent of total impacts. In the area proposed for exclusion, habitat management activities compose the total impacts; these are impacts expected to result from the Tribal HCP. Of the area considered for exclusion, habitat management has the highest total impacts, between 66 and 69 percent, depending on the discount rate. Development has the next highest impacts for these units at 20 to 22 percent.
9. Exhibit ES-6 ranks incremental impacts by activity and at three and seven percent discount rates. For areas proposed for designation, forecast incremental effects due to habitat management make up the majority (96 to 97 percent) of the total impacts. In the area proposed for exclusion, habitat management (78 percent) and development (21 percent) activities are the source of impacts; these are impacts expected to result from the Tribal HCP that is being prepared in anticipation of critical habitat designation. Of the areas considered for exclusion, habitat management and transportation activities make up the total impacts, which are less than \$10,000 (present value applying both three and seven percent discount rates).
10. Exhibit ES-7 provides an overview of the study area in relation to the essential habitat defined by the species recovery plan and the critical habitat designated in 2001. Exhibit ES-8 displays land ownership across the study area. Exhibit ES-9 provides a geographic display of the post-designation impacts by activity for each critical habitat unit. Exhibit ES-10 provides a geographic display of the incremental impacts by activity for each critical habitat unit. The share of activity impacts relative to each other is presented graphically in Exhibits ES-9 and ES-10.

## EXHIBIT ES-2 PRE-DESIGNATION IMPACTS TO ALL ACTIVITIES BY UNIT

UNIT	PRESENT VALUE 3% DISCOUNT RATE	PRESENT VALUE 7% DISCOUNT RATE
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$21,400	\$25,300
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$848,000	\$1,090,000
3. Carrizo Canyon	\$2,550,000	\$2,840,000
<b>TOTAL</b>	<b>\$3,420,000</b>	<b>\$3,960,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$598,000	\$658,000
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$39,000	\$45,700
2A. North Santa Rosa Mountains	\$13,600,000	\$15,900,000
<b>TOTAL</b>	<b>\$13,600,000</b>	<b>\$16,000,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan.		

**EXHIBIT ES-3 POST-DESIGNATION BASELINE IMPACTS TO ALL ACTIVITIES BY UNIT**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$37,900	\$28,100	\$2,550	\$2,650
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$30,700,000	\$22,700,000	\$2,060,000	\$2,140,000
3. Carrizo Canyon	\$61,700,000	\$44,700,000	\$4,150,000	\$4,210,000
<b>TOTAL</b>	<b>\$92,500,000</b>	<b>\$67,400,000</b>	<b>\$6,220,000</b>	<b>\$6,360,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$499,000	\$369,000	\$33,500	\$34,800
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$5,790,000	\$3,990,000	\$330,000	\$343,000
2A. North Santa Rosa Mountains	\$80,500,000	\$55,700,000	\$4,620,000	\$4,810,000
<b>TOTAL</b>	<b>\$86,300,000</b>	<b>\$59,700,000</b>	<b>\$4,950,000</b>	<b>\$5,150,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan. These estimates include conservation impacts for land acquisition projected through 2037.				

**EXHIBIT ES-4 INCREMENTAL IMPACTS TO ALL ACTIVITIES BY UNIT**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$5,260	\$4,030	\$354	\$380
3. Carrizo Canyon	\$405,000	\$302,000	\$27,200	\$28,500
<b>TOTAL</b>	<b>\$411,000</b>	<b>\$306,000</b>	<b>\$27,600</b>	<b>\$28,900</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$11,300,000	\$8,310,000	\$758,000	\$785,000
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$2,440	\$2,440	\$164	\$230
2A. North Santa Rosa Mountains	\$6,410	\$5,480	\$431	\$517
<b>TOTAL</b>	<b>\$8,850</b>	<b>\$7,920</b>	<b>\$595</b>	<b>\$747</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan. These estimates include conservation impacts for land acquisition projected through 2037.				

## EXHIBIT ES-5 ACTIVITIES RANKED BY LEVEL OF POST-DESIGNATION BASELINE IMPACTS

ACTIVITY	DISCOUNTED AT THREE PERCENT		DISCOUNTED AT SEVEN PERCENT	
	ESTIMATED IMPACTS	PERCENT OF TOTAL	ESTIMATED IMPACTS	PERCENT OF TOTAL
<b>PROPOSED CRITICAL HABITAT</b>				
Development	\$65,200,000	70.5%	\$48,200,000	71.5%
Mining	\$19,200,000	20.8%	\$13,200,000	19.6%
Recreation	\$6,070,000	6.6%	\$4,490,000	6.7%
Habitat Management	\$1,880,000	2.0%	\$1,390,000	2.1%
Utilities	\$120,000	0.1%	\$91,900	0.1%
Transportation	\$7,130	0.0%	\$7,130	0.0%
<b>Total</b>	<b>\$92,500,000</b>		<b>\$67,400,000</b>	
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
Habitat Management	\$499,000	100.0%	\$369,000	100.0%
Development	\$0	0.0%	\$0	0.0%
Mining	\$0	0.0%	\$0	0.0%
Recreation	\$0	0.0%	\$0	0.0%
Transportation	\$0	0.0%	\$0	0.0%
Utilities	\$0	0.0%	\$0	0.0%
<b>TOTAL</b>	<b>\$499,000</b>		<b>\$369,000</b>	
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
Habitat Management	\$59,500,000	68.9%	\$39,700,000	66.5%
Development	\$17,500,000	20.3%	\$12,900,000	21.6%
Transportation	\$6,110,000	7.1%	\$4,680,000	7.8%
Recreation	\$3,230,000	3.7%	\$2,390,000	4.0%
Mining	\$0	0.0%	\$0	0.0%
Utilities	\$0	0.0%	\$0	0.0%
<b>Total</b>	<b>\$86,300,000</b>		<b>\$59,700,000</b>	
Notes: Totals may not sum due to rounding.				
(1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan				
(2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan. These estimates include conservation impacts for land acquisition projected through 2037.				



## EXHIBIT ES-6 ACTIVITIES RANKED BY LEVEL OF INCREMENTAL IMPACTS

ACTIVITY	DISCOUNTED AT THREE PERCENT		DISCOUNTED AT SEVEN PERCENT	
	ESTIMATED IMPACTS	PERCENT OF TOTAL	ESTIMATED IMPACTS	PERCENT OF TOTAL
<b>PROPOSED CRITICAL HABITAT</b>				
Development	\$398,000	96.8%	\$294,000	96.1%
Mining	\$5,260	1.3%	\$4,030	1.3%
Recreation	\$4,880	1.2%	\$4,880	1.6%
Habitat Management	\$2,380	0.6%	\$2,380	0.8%
Utilities	\$0	0.0%	\$0	0.0%
Transportation	\$0	0.0%	\$0	0.0%
<b>Total</b>	<b>\$411,000</b>		<b>\$306,000</b>	
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
Habitat Management	\$8,860,000	78.4%	\$6,530,000	78.6%
Development	\$2,410,000	21.3%	\$1,780,000	21.4%
Mining	\$0	0.0%	\$0	0.0%
Recreation	\$0	0.0%	\$0	0.0%
Transportation	\$0	0.0%	\$0	0.0%
Utilities	\$0	0.0%	\$0	0.0%
<b>TOTAL</b>	<b>\$11,300,000</b>		<b>\$8,310,000</b>	
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
Habitat Management	\$4,880	55.1%	\$4,880	61.6%
Development	\$3,970	44.9%	\$3,040	38.4%
Transportation	\$0	0.0%	\$0	0.0%
Recreation	\$0	0.0%	\$0	0.0%
Mining	\$0	0.0%	\$0	0.0%
Utilities	\$0	0.0%	\$0	0.0%
<b>Total</b>	<b>\$8,850</b>		<b>\$7,920</b>	
Notes: Totals may not sum due to rounding.				
(1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan				
(2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan. These estimates include conservation impacts for land acquisition projected through 2037.				

EXHIBIT ES-7 SPECIES RECOVERY PLAN AREA AND PROPOSED CRITICAL HABITAT

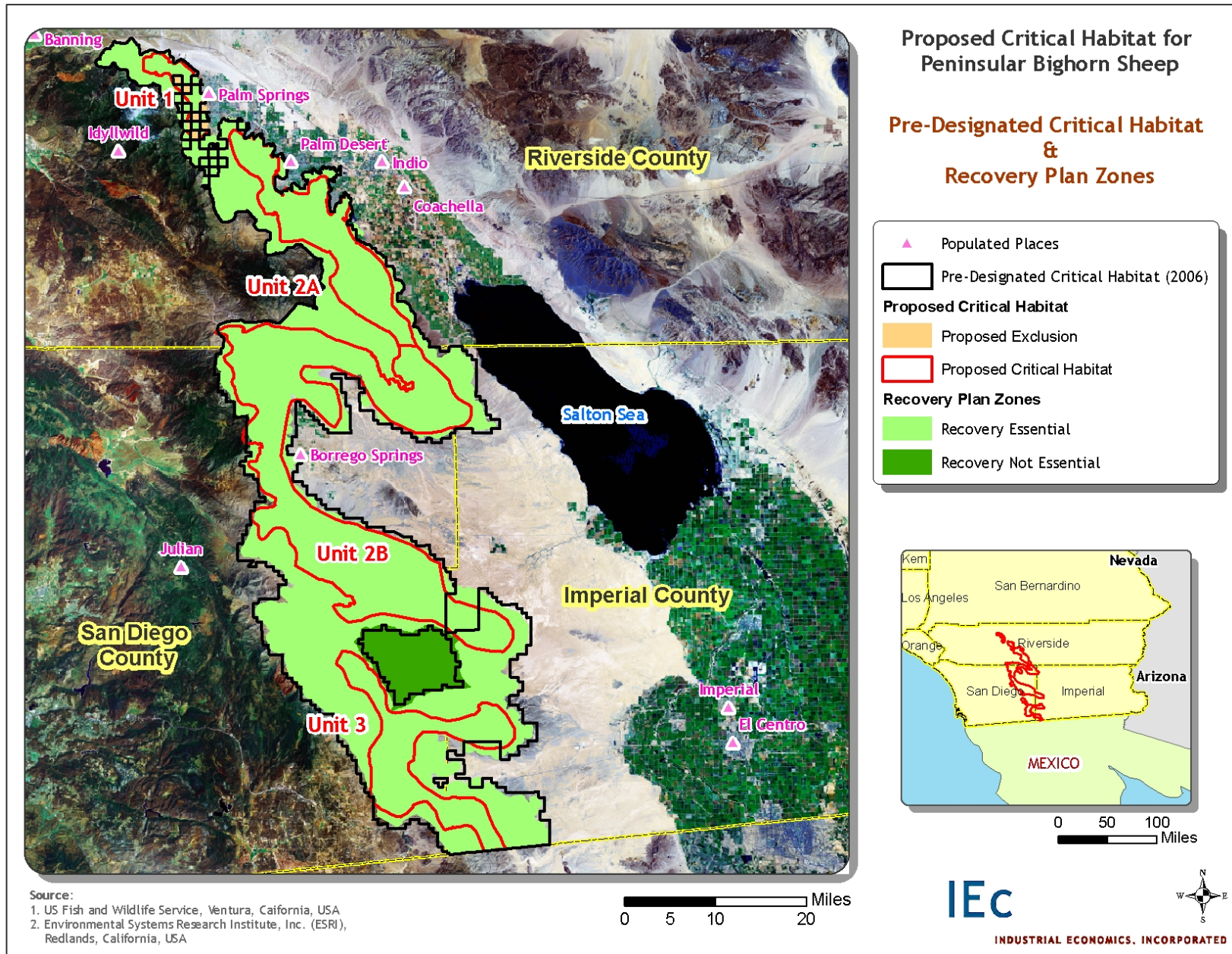
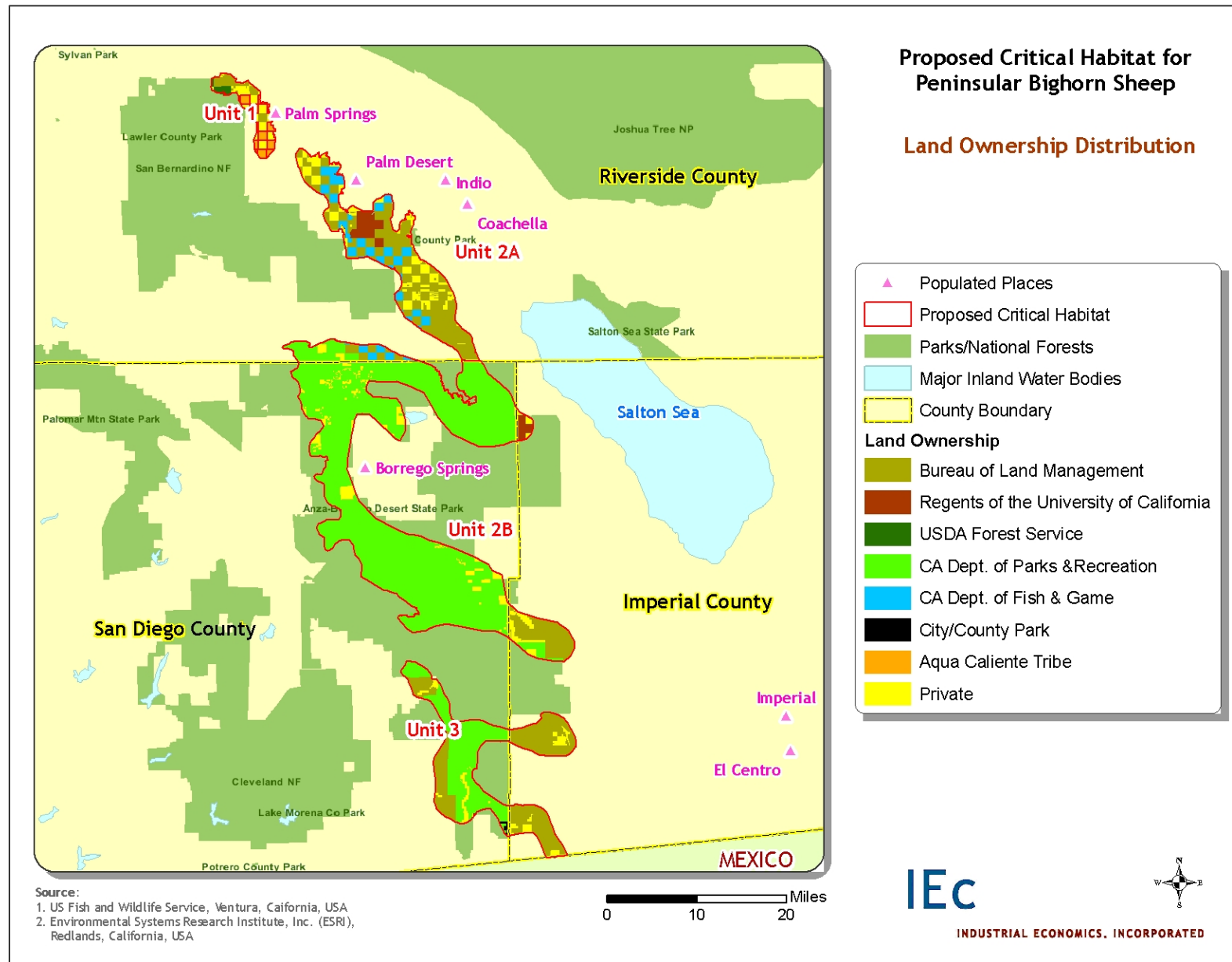


EXHIBIT ES-8 LAND OWNERSHIP IN PROPOSED CRITICAL HABITAT



**EXHIBIT ES-9 PROPOSED CRITICAL HABITAT UNITS AND POST-DESIGNATION BASELINE ACTIVITY IMPACTS (DISCOUNTED AT 3 PERCENT)**

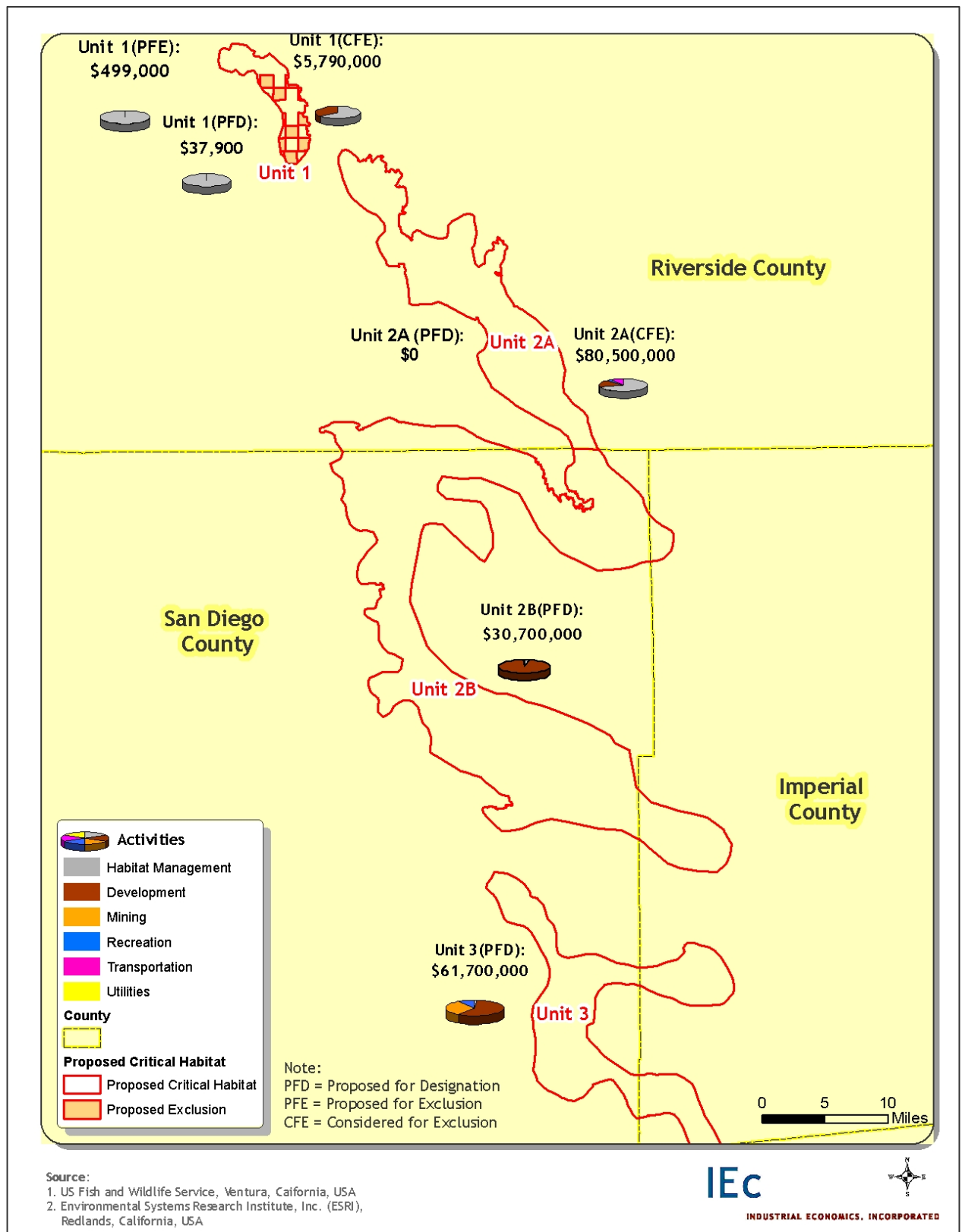
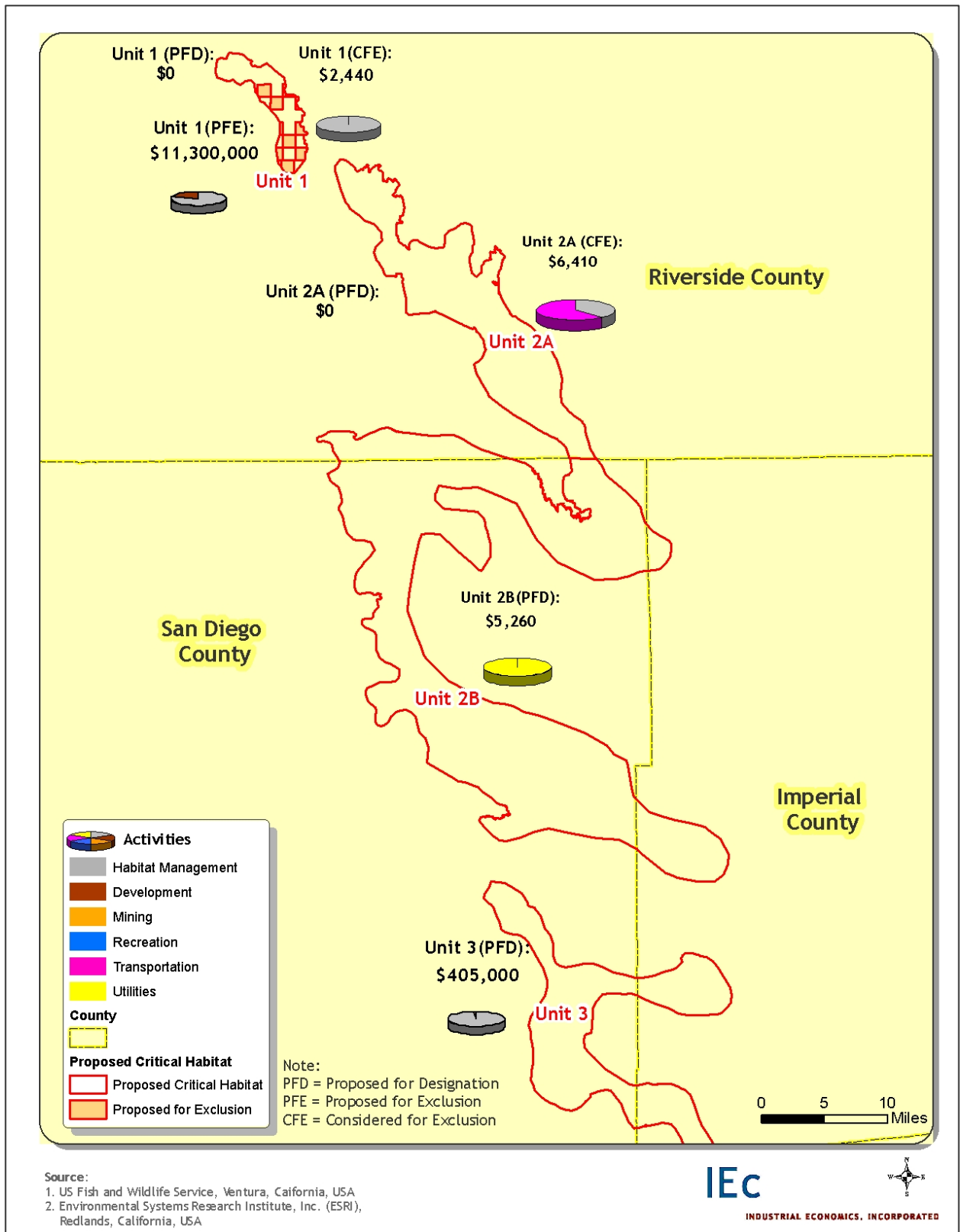




EXHIBIT ES-10 PROPOSED CRITICAL HABITAT UNITS AND INCREMENTAL ACTIVITY IMPACTS  
(DISCOUNTED AT 3 PERCENT)



## CHAPTER 1 | FRAMEWORK FOR THE ANALYSIS

1. The purpose of this report is to estimate the economic impact of actions taken to protect the Federally listed bighorn sheep (*Ovis canadensis nelsoni*, hereafter, "bighorn sheep") and its habitat. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas considered for critical habitat designation. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the bighorn sheep; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the bighorn sheep. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur after the proposed critical habitat is finalized.
2. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.<sup>4</sup> In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).<sup>5</sup>
3. This section describes the framework for the analysis. First, it describes the case law that led to the selection of the framework applied in this report. It then describes in economic terms the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both efficiency and distributional effects. Next, this section defines the analytic framework used to measure these impacts in the context of critical habitat regulation, including the link between existing and critical habitat-related protection efforts and potential impacts, and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis and the structure of the report.

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<sup>4</sup> 16 U.S.C. §1533(b)(2).

<sup>5</sup> Executive Order 12866, Regulatory Planning and Review, September 30, 1993 (as amended by Executive Order 13258 (2002) and Executive Order 13422 (2007)); Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. § 601 et seq; and Pub Law No. 104-121.

## 1.1 BACKGROUND

4. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."<sup>6</sup> In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.
5. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable coextensively to other causes.<sup>7</sup> Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA.”<sup>8</sup>

6. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.<sup>9</sup> For example, In the March 2006 court order ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

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<sup>6</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>7</sup> *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

<sup>8</sup> *Ibid.*

<sup>9</sup> *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *CBD v. BLM*, 422 F. Supp. 2d 1115 (N.D. Cal. 2006).

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep’t of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service’s baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a designation, the world with the designation must be compared to the world without it.’”<sup>10</sup>

7. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:
  - a. the baseline impacts of bighorn sheep conservation from protections afforded the species absent critical habitat designation; and
  - b. the estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

Summed, these two types of impacts comprise the fully co-extensive impacts of bighorn sheep conservation in areas considered for critical habitat designation.

8. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.<sup>11</sup> Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.<sup>12</sup> Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species. A detailed description of the methodology used to define baseline and incremental impacts is provided later in this section.

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<sup>10</sup> *Center for Biological Diversity et al, Plaintiffs, v. Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*. Order re: Cross Motions for Summary Judgment. Case 3:03-cv-02509 Document 174 Filed 03/14/2006. Pages 44-45.

<sup>11</sup> Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

<sup>12</sup> *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

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## 1.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

9. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the bighorn sheep and its habitat (hereinafter referred to collectively as “bighorn sheep conservation efforts”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of bighorn sheep conservation efforts.
10. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a relatively small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

### 1.2.1 EFFICIENCY EFFECTS

11. At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect bighorn sheep habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.<sup>13</sup>
12. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Forest Service, may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or

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<sup>13</sup> For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

13. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.
14. This analysis begins by measuring impacts associated with efforts undertaken to protect bighorn sheep and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation efforts is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets.

#### 1.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

15. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.<sup>14</sup> This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

##### Impacts on Small Entities and Energy Supply, Distribution, and Use

16. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future species conservation efforts.<sup>15</sup> In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.<sup>16</sup>

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<sup>14</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>15</sup> 5 U.S.C. § 601 et seq.

<sup>16</sup> Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

#### Regional Economic Effects

17. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
18. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
19. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

#### 1.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

20. This analysis identifies those economic activities most likely to threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid or minimize such threats within the boundaries of the study area. This section provides a description of the methodology used to separately identify baseline impacts and incremental impacts stemming from the proposed designation of critical habitat for the bighorn sheep. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

##### 1.3.1 IDENTIFYING BASELINE IMPACTS

21. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, that provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. The "without critical habitat

designation" scenario, which represents the baseline for this analysis, considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

22. Baseline impacts include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species.

- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts. Baseline administrative costs of section 7 consultation are summarized later in Exhibit 1-2.
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<sup>17</sup> The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.<sup>18</sup> The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

23. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State

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<sup>17</sup> 16 U.S.C. 1532.

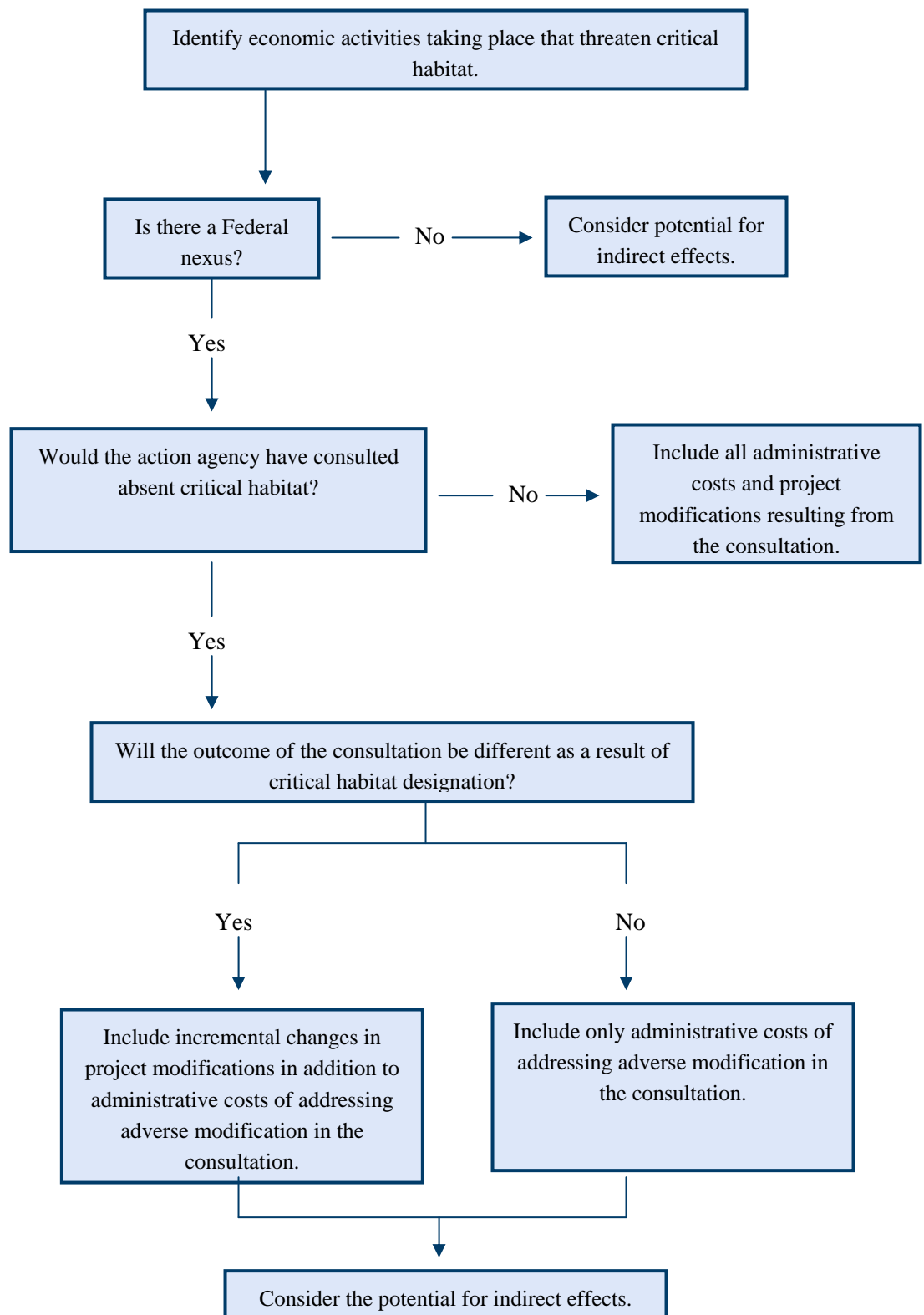
<sup>18</sup> U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

#### 1.3.2 IDENTIFYING INCREMENTAL IMPACTS

24. This analysis separately quantifies the incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
25. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing project modifications resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline, and are considered incremental impacts of the rulemaking.
26. Exhibit 1-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.

## EXHIBIT 1-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



27. Incremental impacts may be the direct compliance costs associated with additional effort for forecast consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., developing habitat conservation plans (HCPs) in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

#### Direct Impacts

28. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

#### Administrative Section 7 Consultation Costs

29. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
30. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation**  
- New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
  2. **Re-initiation of consultation to address adverse modification -**  
Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and

project modification costs are considered incremental impacts of the designation.

3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.

31. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation as it may not be possible to predict the outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in the estimated range of administrative costs of consultation employed in this analysis.
32. Exhibit 1-2 provides estimated consultation costs representing effort required for all types of consultation, including those that considered both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied.
  - The costs of a consultation that only considers jeopardy or only adverse modification (i.e., an incremental consultation only occurring because of the designation of critical habitat) are attributed wholly to the baseline or to critical habitat, respectively.
  - Incremental costs of the re-initiation of a consultation because of the critical habitat designation are assumed to be approximately half the cost of the original consultation that considered only jeopardy. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species.
  - Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations that will already be required to consider jeopardy result in the least incremental effort of these three consultation categories, roughly half that of a re-initiation.

Importantly, the estimated costs represent the midpoint of a potential range of impacts to account for variability regarding levels of effort of specific consultations.



## EXHIBIT 1-2 RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS, \$2007

BASELINE ADMINISTRATIVE COSTS OF CONSULTATION (\$2007)					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
CONSULTATION CONSIDERING ONLY JEOPARDY (NO CONSIDERATION OF CRITICAL HABITAT DESIGNATION)					
Technical Assistance	\$530	n/a	\$1,050	n/a	\$1,500
Informal	\$2,300	\$2,900	\$2,050	\$2,000	\$9,500
Formal	\$5,150	\$5,800	\$3,500	\$4,800	\$19,500
Programmatic	\$15,500	\$13,000	n/a	\$5,600	\$34,100
EFFORT TO ADDRESS JEOPARDY IN A NEW CONSULTATION THAT CONSIDERS BOTH JEOPARDY AND ADVERSE MODIFICATION					
Technical Assistance	\$398	n/a	\$788	n/a	\$1,130
Informal	\$1,730	\$2,180	\$1,540	\$1,500	\$7,130
Formal	\$3,860	\$4,350	\$2,630	\$3,600	\$14,600
Programmatic	\$11,600	\$9,710	n/a	\$4,200	\$25,500
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION (\$2007)					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
INCREMENTAL CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION					
Technical Assistance	\$530	n/a	\$1,050	n/a	\$1,500
Informal	\$2,300	\$2,900	\$2,050	\$2,000	\$9,500
Formal	\$5,150	\$5,800	\$3,500	\$4,800	\$19,500
Programmatic	\$15,500	\$13,000	n/a	\$5,600	\$34,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$265	n/a	\$525	n/a	\$750
Informal	\$1,150	\$1,450	\$1,030	\$1,000	\$4,750
Formal	\$2,580	\$2,900	\$1,750	\$2,400	\$9,750
Programmatic	\$7,750	\$6,480	n/a	\$2,800	\$17,000
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION					
Technical Assistance	\$133	n/a	\$263	n/a	\$375
Informal	\$575	\$725	\$513	\$500	\$2,380
Formal	\$1,290	\$1,450	\$875	\$1,200	\$4,880
Programmatic	\$3,880	\$3,240	n/a	\$1,400	\$8,510
Source: IEC analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2007, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Totals may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

### Section 7 Project Modification Impacts

33. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of project modifications undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.
1. **Additional effort to address adverse modification in a new consultation**  
- Only project modifications associated solely with avoiding or minimizing adverse modification are considered incremental.
  2. **Re-initiation of consultation to address adverse modification** - Only project modifications associated solely with avoiding or minimizing adverse modification are considered incremental.
  3. **Incremental consultation resulting entirely from critical habitat designation** - Impacts of all project modifications are considered incremental.

### Indirect Impacts

34. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes to economic behavior that may occur outside of the Act, through other Federal, State, or local actions, that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

### Habitat Conservation Plans

35. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.
36. Application for an incidental take permit and completion of an HCP is not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a

landowner to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation.

#### Other State and Local Laws

37. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.
38. The California Environmental Quality Act (CEQA), for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were “categorically exempt” from preparing an Environmental Impact Report under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.

#### Additional Indirect Impacts

39. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
  - **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
  - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty

stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.

- **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

### 1.3.3 BENEFITS

40. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.<sup>19</sup> OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.<sup>20</sup>
41. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.<sup>21</sup> *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
42. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions

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<sup>19</sup> Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

<sup>20</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>21</sup> Ibid.

undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

43. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

#### 1.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

44. The geographic scope of the analysis includes all areas identified as critical habitat, including the areas proposed for exclusion from the final designation. Collectively, these areas are referred to as the "study area" for the purposes of this analysis. Although the entire study area is analyzed, emphasis is placed on understanding impacts in areas proposed for final designation. Note that economic activities affecting critical habitat may be sited outside of the boundaries of the study area (e.g., upstream activities); these activities are considered relevant to this analysis. The analysis quantifies impacts to land use activities within or affecting the entire study area, but focuses on those areas proposed for final critical habitat.

#### 1.3.5 ANALYTIC TIME FRAME

45. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis estimates economic impacts to activities from 1998 (year of the species' final listing) to 2027 (20 years from the expected year of final critical habitat designation). Estimated impacts are divided into pre-designation (1998-2007) and post-designation (2008-2027) impacts.<sup>22</sup> The land uses within the study area are not expected to substantially change over this time period.
46. Where information is available to reliably forecast economic activity beyond the 20-year time frame, this analysis incorporates that information. For the case of post-designation land acquisition in the Coachella Valley MS HCP, where land acquisition can be definitively predicted, it is reasonable to predict a 30 year time frame. In this case,

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<sup>22</sup> As described in the Proposed Rule, the Service first designated critical habitat for this species in 2001 (U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for Peninsular Bighorn Sheep; Final Rule, 66 FR 17, February 1, 2001). "Pre-designation" and "post-designation" in this report refer to the revised final critical habitat designation expected in 2008.

impacts are predicted from 2008 to 2037. While the decreased land value is calculated assuming the services provided by those lands are lost in perpetuity, the resulting estimate reflects an impact on land value that is expected to be experienced at the time the rule is made final. It is therefore an impact that is assumed to be experienced within a 20-year time frame.

47. This analysis provides the net present values of sums of impacts over pre-designation and post-designation years, discounted at three percent and seven percent. OMB recommends the use of a seven percent discount rate to make future costs or benefits comparable to current values. OMB further recommends that an additional discount rate be applied to test how sensitive the results are to the choice of the discount rate. As noted in Circular A-4, one common discount rate advocated by economists is three percent.<sup>23</sup> Appendix C provides an explanation of how net present and annualized values are calculated then provides details on impacts by activity. Appendix D presents undiscounted impacts by year.

#### 1.4 INFORMATION SOURCES

48. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, Federal, State, and local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records, and existing habitat management and conservation plans that consider the bighorn sheep. Due to the high number of entities contacted, the complete list of contacted stakeholders is within the reference section at the end of this document.

#### 1.5 STRUCTURE OF THE REPORT

49. This remainder of this report is organized as follows:
- Chapter 2: Potential economic impacts to species management, and grazing activities;
  - Chapter 3: Potential economic impacts to development-related activities;
  - Chapter 4: Potential economic impacts to mining-related activities;
  - Chapter 5: Potential economic impacts to recreation-related activities;
  - Chapter 6: Potential economic impacts to transportation-related activities;
  - Chapter 7: Potential economic impacts related to utility construction;
  - References;
  - Appendix A: Small Business Analysis and Energy Impacts Analysis;
  - Appendix B: Study Area Maps; and
  - Appendix C: Detailed Impacts to Activity by Unit.
  - Appendix D: Undiscounted Impacts by Year

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<sup>23</sup> Office of Management and Budget, *Circular A-4*, September 17, 2003, p. 18).

## CHAPTER 2 | POTENTIAL ECONOMIC IMPACTS TO SPECIES MANAGEMENT ACTIVITIES

50. This chapter quantifies species management conservation efforts for the bighorn sheep undertaken by Federal, State, and local agencies, and non-governmental organizations. The direct economic impacts associated with these efforts stem from development and implementation of land and species management plans, and research conducted to better understand the species and its habitat requirements. In some cases, economic effects of these plans may accrue to other activities (e.g., restrictions on development, recreation, or grazing). Impacts to grazing are included in this chapter, whereas other impacts are described and quantified in the other relevant chapters of this report. This chapter first describes the management plans and other management activities; it then provides estimates of the pre-designation baseline, post-designation baseline, and incremental impacts of species management and grazing.

### 2.1 MANAGEMENT PLANS

51. A variety of management plans with provisions for conservation of the bighorn sheep cover lands that are within the proposed critical habitat area. Three of the plans are Habitat Conservation Plans (HCPs): the Coachella Valley Multiple Species HCP, the Agua Caliente Band of Cahuilla Indians' Tribal HCP, and the Eastern San Diego County HCP.<sup>24</sup> All of the HCPs described below that incorporate conservation of the bighorn sheep also cover other species. Where possible, this analysis identifies and presents those impacts resulting from development or implementation of the portions of the HCPs expressly designed for conservation of the bighorn sheep. The impetus for each plan varies, but only the Tribal HCP was initiated solely in response to or expectation of the designation of critical habitat for the bighorn sheep. Therefore, aside from those impacts associated with the Tribal HCP, impacts related to these plans are considered to be baseline (e.g., development of the Coachella Valley MSHCP began in 1995 before the bighorn sheep was listed).

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<sup>24</sup> Non-Federal entities must develop HCPs when applying for incidental take permits under section 10(a)(1)(b) of the Act. Incidental take permits authorize the 'take' of endangered or threatened species during the course of otherwise lawful activities. The plans can authorize take for more than one permittee, and for more than one species.



### 2.1.1 COACHELLA VALLEY MULTIPLE SPECIES HABITAT CONSERVATION PLAN (UNITS 1 AND 2A)

52. The Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP) "is intended to satisfy the legal requirements for the issuance of permits that will allow the take of species covered by the plan in the course of otherwise lawful activities."<sup>25</sup> The MSHCP was developed by a group of over 20 Federal, state, and local entities, beginning in 1995 and it is expected to be finalized in 2008. The landowning Federal and state agencies in the MSHCP study area include the Bureau of Land Management (BLM) and the California Department of Fish and Game (CDFG).
53. The MSHCP addresses conservation of species and habitat on approximately 1.1 million acres within the Coachella Valley watershed, in eastern Riverside County. It does so in part by establishing a Reserve System that links existing public and private conservation and non-conservation lands under the same management framework. The bighorn sheep is one of 27 species included in the MSHCP.
54. Lands identified in the MSHCP for the conservation of the bighorn sheep are based on the Essential Habitat areas defined in the Service's Recovery Plan for the sheep.<sup>26</sup> A total of 165,856 acres of Essential Habitat are to be conserved in the MSHCP's Reserve System. Of these, 88,733 acres are within the proposed critical habitat on a variety of land ownership types (i.e., all areas proposed for designation and considered for exclusion in Unit 1 and Unit 2A). The Service is considering exclusion of the non-Federal lands that will be covered by the MSHCP, because it believes that when implemented, the Plan "will provide conservation strategies and measures consistent with the conservation of the bighorn sheep."<sup>27</sup> In addition, the Service may consider excluding the Federal (BLM) and State (California Department of Fish and Game) lands that are within the MSHCP area, based on the agencies' participation in the MSHCP development, and the BLM's commitment to manage their lands in a manner consistent with the MSHCP.<sup>28</sup> Lands in Units 1 and 2A that are not being considered for exclusion are the U.S. Forest Service land in Unit 1, California State Lands Commission land in Unit 2A, and University of California Land in Unit 2A, which are all proposed for designation.
55. The activities covered by the MSHCP are:
  - development approved or permitted by local permittees;
  - public facility construction operations and maintenance;

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<sup>25</sup> Coachella Valley Association of Governments (CVAG). 2007. Final Draft Recirculated Coachella Valley Multiple Species Habitat Conservation Plan, page ES-1.

<sup>26</sup> CVAG, 2007. Final Draft Recirculated Coachella Valley MSHCP, glossary of terms; U.S. Fish and Wildlife Service. 2000. Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California.

<sup>27</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Habitat for the Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*) and Proposed Taxonomic Revision; Proposed Rule, 72 FR 195, October 10, 2007.

<sup>28</sup> See the Proposed Rule at Page 57757 to 57758. Decision to consider for exclusion will be based on public comments received.

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- safety and emergency response activities;
- certain transportation projects;
- County flood control projects;
- construction and maintenance of trails and public access facilities; and
- expansion of mining operations on non-Federal land.

Details of how impacts to bighorn sheep from these activities will be minimized and avoided under the MSHCP are given in the chapters of this report for the relevant activities. This chapter presents the costs of development and implementation of the species and habitat management portions of the MSHCP. The economic impacts from MSHCP implementation and management are considered to be part of the baseline impacts since the MSHCP was initiated in 1995, before either listing or critical habitat had been established.<sup>29</sup>

#### Plan Implementation - Land Acquisition

56. The MSHCP Reserve System will include existing conservation lands (e.g., CDFG and BLM lands), as well as lands acquired from private entities for conservation. The MSHCP indicates a total of 30,226 acres are to be acquired for conservation of the bighorn sheep.<sup>30</sup> The MSHCP calculation of the total acquisition costs relies on a 2005 market study that reviewed current sales and listing prices of comparable properties to project the cost of acquisition in different Conservation Areas. This analysis uses these projected market values of lands (from the 2005 market study) to estimate the total costs of acquisition.<sup>31</sup> Exhibit 2-1 lists the acres to be conserved for the bighorn sheep in each of the conservation areas, the range of costs and the total land acquisition costs for the bighorn sheep. In addition to the almost \$92.8 million of acquisition costs, land improvement and transaction costs will also be incurred; these costs are not quantified for lack of specific, publicly available information that would allow their estimation.
57. The acquisition will be partially funded with revenues from a development mitigation fee levied on residential and commercial development within the MSHCP. To estimate the area of land that is likely to be developed, this analysis relies on the estimate of acres “approved for disturbance” according the MSHCP. A total of 3,867 acres within proposed critical habitat are approved for disturbance. Multiplying this number of acres by the per-acre mitigation fee developed in the MSHCP of \$5,730, yields the total

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<sup>29</sup> Note: The full administrative costs of developing the MSHCP, or that portion of the costs attributable to developing conservation for the bighorn sheep are not available. The costs of development of the Trails Plan which contains specific objectives related to the bighorn sheep are available, and are included in Chapter 4: Recreation. This is discussed further below.

<sup>30</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP; pp 9-262.

<sup>31</sup> Scarcella, 2005. A Market Study of Land Values, Related to Several Areas of Prospective Acquisition, Associated with the Coachella Valley Multiple Species Habitat Conservation Plan. As cited in CVAG 2007.

estimate of the mitigation fee contribution to the acquisition fund. The total land acquisition value calculated to be raised by development mitigation fees is \$22,200,000 (undiscounted). Impacts from the mitigation fee for development projects are presented in the analysis in Chapter 3 because these impacts are specific to development. Thus, the estimated cost of acquisition, less the portion funded by the mitigation fee associated with development, is presented here as a direct implementation cost for conservation of the bighorn sheep.

58. This analysis assumes that the 30,077 acres of Conservation lands will be acquired in the future to meet the goals of the MSHCP components pertaining to the bighorn sheep. Although the time frame of this analysis is 20 years, the land acquisitions are planned over the next 30 years. The full costs to purchase all 30,077 acres over 30 years are included in this analysis, since the 30-year expenditures are reasonably foreseeable. The total cost of land acquisitions includes the estimated cost of land purchase and land improvements, and related transaction costs such as appraisals and escrow fees.<sup>32</sup> This net amount is indicated in the last row of Exhibit 2-1.

**EXHIBIT 2-1 LAND ACQUISITION COSTS RELATED TO BIGHORN SHEEP CONSERVATION EFFORTS FOR THE COACHELLA VALLEY MSHCP**

CONSERVATION AREA	RELATION TO PROPOSED CRITICAL HABITAT <sup>1</sup>	ACRES TO BE ACQUIRED	AVERAGE COST PER ACRE	TOTAL ACQUISITION COST
Cabazon	Outside	83	\$3,100	\$257,000
Snow Creek/Windy Point	At least 90% within Unit 1	587	\$1,850	\$1,086,000
Santa Rosa & San Jacinto Mountains	Within Units 1 and 2A	29,490	\$3,095	\$91,300,000
<b>Total for Plan Area</b>	-	<b>30,226</b>	-	<b>\$92,800,000</b>
<b>Total for Proposed Critical Habitat</b>	-	<b>30,077</b>	-	<b>\$92,400,000</b>
Less Development Mitigation Fees <sup>2</sup>				<b>(\$22,200,000)</b>
<b>Net Acquisition Total for Proposed Critical Habitat</b>				<b>\$70,200,000</b>
Notes: Totals may not sum due to rounding. (1) Cabazon Conservation area is not within the proposed critical habitat. Until confirmation with GIS is possible, this analysis assumes that all of the Snow Creek/Windy Point Conservation Area is within proposed critical habitat (see footnote 23 for further detail on information expected). (2) The revenues collected from these fees have been calculated by the MSHCP to be a portion of the total revenues used for acquisition. These fee revenues are presented in Chapter 3 because they are development impacts.				

<sup>32</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP; pp 5-3.

59. Without an estimate of when development will occur and generate mitigation fees to fund the land acquisition, it is not possible to predict the timing of the impacts exhibited above. In total, in 2007 dollars, the acquisition of conservation land within the proposed critical habitat for the bighorn sheep is \$70.2 million. MSHCP implementation research and monitoring costs associated with the first 20 years of the land acquisition program are summed with the land acquisition costs for the first 20-year period of this analysis. Assuming an equal likelihood in all years in the 30-year horizon for land acquisition outlined in the MSHCP,<sup>33</sup> the total impacts from acquiring this land for the conservation of the species are \$31.1 million (applying a seven percent discount rate). Annualized, these impacts are \$2.50 million (applying a seven percent discount rate). The estimates for each time period are presented in the total post-designation baseline impacts table, Exhibit 2-4.

#### Plan Implementation - Monitoring

60. The MSHCP specifies costs of monitoring and research investigating the impacts of trail use on the bighorn sheep.<sup>34</sup> Costs of equipment and supplies supporting these activities are also estimated. These costs are expected to total \$255,000 annually. Over the 20 years of this analysis, these impacts total \$2.95 million, or an annualized impact of \$295,000 (applying a seven percent discount rate). It is important to note that other general activities under the MSHCP will also benefit the bighorn sheep. These activities include administrative support for the program, and specialist personnel (e.g., GIS technicians). The total expected annual cost of the monitoring program is \$1.03 million (2008 dollars). Over the 20-year period of this analysis, a total of \$12.0 million (applying a seven percent discount rate) would be spent on the full monitoring program.<sup>35</sup>

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<sup>33</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP, pp 5-6.

<sup>34</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP Table 8-11, pp. 8-111.

<sup>35</sup> Note that only the portions of the monitoring program attributable to bighorn sheep conservation are included in the summary impacts given in the tables in this chapter, and elsewhere in this draft report. These figures may underestimate the full costs attributable to the activities and administrative management under the MSHCP for the bighorn sheep. However, with available information, it is not possible to estimate the portion of the total plan implementation costs (or, as in this instance, the monitoring program costs) attributable to bighorn sheep conservation efforts. The alternative, using the full expected costs would be a poor approximation of those impacts attributable to bighorn sheep, as they cover 27 species of both plants and animals, and include program elements completely separate from bighorn sheep conservation.

### 2.1.2 AGUA CALIENTE BAND OF CAHUILLA INDIANS HABITAT CONSERVATION PLAN (UNIT 1)

61. Approximately 4,512 acres of Tribal land owned by the Agua Caliente Band of Cahuilla Indians within Unit 1 are proposed for exclusion.<sup>36</sup> A draft multiple species habitat conservation plan developed by the Tribe (Tribal HCP) for approximately 36,720 acres of land includes the 4,512 in Unit 1. The Tribal HCP covers 21 species (18 animals and 3 plants), including the bighorn sheep. The portions of the Tribal HCP that are designed to conserve the bighorn sheep have been developed as a result of ongoing concerns about the designation of critical habitat on Tribal lands.<sup>37</sup>
62. The goals of the Tribal HCP are for the Tribe to assume a leadership role in managing resources on the Agua Caliente Reservation, and to streamline permitting with respect to protected species for parties including the Tribe that may develop areas of Tribal land. In addition, it “provides the means to protect and contribute to the conservation of Federally listed species or those deemed by the Tribe and USFWS to be sensitive and potentially in need of listing in the future (collectively Covered Species). It provides mechanisms to permit and guide development, and serves as an adaptive tool to allow the Tribe to update and/or revise baseline biological resource information, manage conservation goals and priorities, and complement other existing and planned conservation efforts in the region.”<sup>38</sup> A mitigation fee applied to the activities covered under the Tribal HCP will fund establishment of a Habitat Preserve.
63. Prior to the development of the Tribal HCP, the Tribe has expended funds since 2004 on species management efforts for the bighorn sheep in Tahquitz Canyon, which is partially within the proposed critical habitat boundary.<sup>39</sup> These efforts include attendance at recovery team meetings, monitoring in Tahquitz Canyon by Tribal rangers and maintenance crews, processing for sheep releases, carcass discovery/authorization, and fecal pellet surveys. These pre-designation baseline costs total \$658,000 (applying a seven percent discount rate).
64. Some of the costs mentioned above are expected to continue in the future and are therefore considered baseline. Certain forecast impacts will be funded by the Tribal

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<sup>36</sup> In a public comment on the proposed rule, a representative for the Tribe noted that off-reservation Tribal lands occur in the proposed Unit 2A as well as those described in the proposed rule that occur in Unit 1 (Public Comment submitted by Paul S. Weiland of Nossaman, Guthner, Knox & Elliot, LLP. Re: Designation of critical habitat for the Peninsular bighorn sheep (*Ovis canadensis nelsoni*), and the proposed taxonomic revision; Proposed Rule, 72 Fed. Reg. 57,740 (proposed October 10, 2007) (to be codified at 50 CFR pt. 17). Dated December 10, 2007). These lands in Unit 2A are also within the area covered by the Tribal HCP. Therefore, some portion of costs of the Tribal HCP may be attributed to conservation activities in these areas. Absent data on the acreage of these areas at this time to be able to apportion costs related to the HCP over Tribal land in both units, this analysis attributes all impacts expected to result from the HCP to the areas proposed for exclusion in Unit 1.

<sup>37</sup> See Consent Decree. 2006. Agua Caliente Band of Cahuilla Indians [and plaintiff-intervenors] vs. U.S. Department of Interior, Fish and Wildlife Service [and defendant-intervenors]. Case No.: EDCV 05-187 VAP (OPx).

<sup>38</sup> Agua Caliente Band of Cahuilla Indians Tribal Habitat Conservation Plan. 2007. pp. ES-1.

<sup>39</sup> Confirmation regarding costs attributable to activities within proposed critical habitat provided from Margaret Park, Director of Planning & Natural Resources, Agua Caliente Band of Cahuilla Indians via email on December 18, 2007.

HCP, and as such, are considered to be incremental to critical habitat. Specifically, monitoring by Tribal rangers and maintenance crews will continue, as will attendance at recovery team meetings and processing for sheep releases. In addition, certain elements of the Tribal HCP will result in costs specifically for the bighorn sheep, including:

- Amending the current fire management plan for Tribal lands in the area,
- Removal of tamarisk/exotic weeds,
- Removal of vegetation around springs and streams, and
- Research to document and quantify use of the bighorn sheep linkages identified in the Tribal HCP.<sup>40</sup>

The post-designation baseline impacts are estimated to total \$369,000 or an annualized amount of \$34,800 (applying a seven percent discount rate). The incremental impacts are estimated to total \$6.53 million or annualized amount of \$616,000 (applying a seven percent discount rate).

65. Additional costs for fencing around development projects are expected with implementation of the Tribal HCP. These forecast impacts are included in Chapter 3 of this report.

#### 2.1.3 EASTERN SAN DIEGO MULTIPLE SPECIES HABITAT CONSERVATION PROGRAM

66. The Eastern San Diego Multiple Species Habitat Conservation Program (also known as the East County Multiple Species Habitat Conservation Program, or East County MSCP) is currently being developed under a combined program coordinated between California's Natural Communities Conservation Planning Act, and Section 10(A) of the Federal Act. As such, it satisfies the requirements for 'take' permit issuance from both the State of California, and the Service. It pre-establishes mitigation requirements for projects, streamlining the formerly project-by-project negotiations for mitigation requirements. The goal of the plan is to acquire or permanently protect 172,000 acres.<sup>41</sup> The East County MSCP covers the land east from the City of Alpine to the County border. The Biological Mitigation Ordinance provides the regulatory basis for implementing the MSCP, and details the minimum mitigation requirements.<sup>42</sup>
67. The completed plan will likely cover over 100 species, the majority of them plants, and 16 habitat types. Bighorn sheep occur primarily within Anza-Borrego Desert State Park in San Diego County, and it is uncertain at this time to what extent activities governed by the plan will be modified for conservation of the bighorn sheep.<sup>43</sup> Due to this uncertainty

<sup>40</sup> Written and personal communication with Margaret Park, Director of Planning & Natural Resources, Agua Caliente Band of Cahuilla Indians, November 3, 2007 and December 5, 2007.

<sup>41</sup> County of San Diego. Multiple Species Conservation Program. Overview. <http://www.mscp-sandiego.org/overview.html>. Accessed December 10, 2007; and Personal communication with Kimberly Zuppiger, East County MSCP Project Manager, County of San Diego, January 23, 2008.

<sup>42</sup> County of San Diego. Biological Mitigation Ordinance. San Diego Code Title 8, Division 6. Chapter 5. Sec. 85.501 - 86.509.

<sup>43</sup> Personal communication with Kimberly Zuppiger, East County MSCP Project Manager, County of San Diego, January 23, 2008.

about the scope and exact location of the future plan boundaries, no impacts can be estimated at this time.

#### 2.1.4 BUREAU OF LAND MANAGEMENT (ALL UNITS)

68. Three plans govern land use and management on Bureau of Land Management (BLM) acreage within the proposed critical habitat Units: the California Desert Conservation Area Plan (CDCA), the Santa Rosa and San Jacinto Mountains National Monument Management Plan (National Monument Plan), and the Eastern San Diego County Proposed Resource Management Plan (RMP).

#### California Desert Conservation Area Plan

69. Under the Federal Land Policy Management Act of 1976,<sup>44</sup> the BLM developed the CDCA in 1980, which covers 25 million acres overall, including 11 million BLM public lands acres in southern California. The CDCA provides broad land use management objectives, assigns land use classifications to all areas and defines Areas of Critical Environmental Concern where additional or special management is deemed appropriate.
70. As a stipulation of a lawsuit settlement brought by plaintiffs seeking formal consultation for threatened and endangered species on CDCA lands,<sup>45</sup> BLM was required to consult with the Service on the CDCA Plan, and did so in 2001-2002. In its Biological Opinion, the Service determined that the twelve interim measures developed by the BLM in order to minimize impacts of activities authorized under that CDCA were effective, and that the CDCA would not result in jeopardy to the bighorn sheep or adverse modification of its habitat so long as they were implemented.<sup>46</sup> The interim measures can generally be described as limiting hiking, OHV and hang-gliding recreational activities (six measures address these activities),<sup>47</sup> limiting communications facilities development, and conducting habitat assessment and conservation activities.<sup>48</sup> Specifically, the species and habitat management-related measures, as described in the Biological Opinion are as follows:
- Exotic species removal will remain a priority task. A schedule of regular exotic species control will be developed and funded annually.
  - Wildfire suppression will allow burning of chaparral wherever safety and property are not threatened.

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<sup>44</sup> Federal Land Policy and Management Act, Sec. 601. [43 U.S.C. 1781]

<sup>45</sup> Case No: C-000927 WHA (JCS), as listed in U.S. Fish and Wildlife Service. "Biological Opinion on California Desert Conservation Area Plan," Formal Consultation # FWS-ERIV/IMP-2810.2, with the Bureau of Land Management. December 23, 2002.

<sup>46</sup> U.S. Fish and Wildlife Service. "Biological Opinion on California Desert Conservation Area Plan," Formal Consultation # FWS-ERIV/IMP-2810.2, with the Bureau of Land Management. December 23, 2002.

<sup>47</sup> See Chapter 5 for impacts related to trail closures associated with these measures.

<sup>48</sup> U.S. Fish and Wildlife Service. "Biological Opinion on California Desert Conservation Area Plan," Formal Consultation # FWS-ERIV/IMP-2810.2, with the Bureau of Land Management. December 23, 2002.

- An inventory of water sources within essential bighorn sheep habitat will be initiated in cooperation with CDFG and the Service. In conjunction with an inventory of existing natural water sources and guzzlers, a study will be conducted to identify specific areas where natural water sources have been lost, the feasibility of restoring water through the construction of artificial guzzlers will be investigated in conjunction with biologists experienced with building guzzlers for bighorn sheep. No guzzlers will be installed without prior consultation with the Service.<sup>49</sup>
- The BLM will develop a list of land acquisition parcels, in conjunction with the Service, within bighorn sheep habitat. Funding sources shall be pursued and bighorn sheep habitat will be acquired as funding becomes available. No land exchanges within or adjacent to bighorn sheep critical habitat will occur without prior consultation and approval by the Service.
- BLM will ensure that all research activities in bighorn sheep habitat are conducted under required permits or agreements. Terms and conditions developed for agreements and permits will be required that ensure disturbance of sheep is minimized. The amount of helicopter use and handling required will be specifically analyzed, in consultation with the Service.<sup>50</sup>

There may be some overlap of BLM costs for exotic species removal, and water source inventory and maintenance with CDFG activities as the agencies collaborate on these efforts. The cost of completing section 7 consultation with the Service for this plan and its interim measures is included in the impacts presented in Exhibit 2-3.<sup>51</sup>

#### [Santa Rosa and San Jacinto Mountains National Monument Management Plan](#)

71. Published in 2003, the National Monument Plan amends the CDCA, and covers 89,500 acres of BLM land out of a total of 271,400 acres.<sup>52</sup> These lands are entirely within the boundaries of the CDCA plan, and the National Monument Plan serves as both a Resource Management Plan (RMP) and an implementation level plan for BLM land management. Within the critical habitat study area, the National Monument comprises the BLM lands shown in Exhibit ES-8 in Units 1 and 2A, and the Riverside County portion of Unit 2B. The National Monument plan incorporates the CDCA management, specifically, the recovery strategy for the bighorn sheep.

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<sup>49</sup> Guzzlers are artificial water sources that wildlife can drink from. Initially designed to benefit game bird populations, guzzlers have been used to increase wildlife populations in areas where water is a limiting factor, to mitigate loss of natural water sources, and to enhance amphibian populations. Arizona Desert Bighorn Sheep Society. 2004. Wildlife Water Developments and Desert Bighorn Sheep in the Southwestern United States.

<sup>50</sup> U.S. Fish and Wildlife Service. "Biological Opinion on California Desert Conservation Area Plan," Formal Consultation # FWS-ERIV/IMP-2810.2, with the Bureau of Land Management. December 23, 2002.

<sup>51</sup> Information is not publicly available to assess the economic impact of the interim conservation measures developed in the biological opinion.

<sup>52</sup> It also covers U.S. Forest Service lands, Tribal, State agency, and local lands. The plan is jointly managed by the Forest Service and the BLM.



Eastern San Diego County Proposed Resource Management Plan

72. The BLM's RMP covers approximately 103,000 acres in eastern San Diego county, including those areas shown in Unit 3 in Exhibit ES-8. No new management for the bighorn sheep is included in the current proposed plan. Changes to livestock grazing availability for the benefit of bighorn sheep is proposed under two alternatives, as described below in section 2.3.2.<sup>53</sup>

## 2.2 OTHER MANAGEMENT ACTIVITIES

### 2.2.1 ANZA-BORREGO DESERT STATE PARK (UNITS 2B AND 3)

73. Anza-Borrego Desert State Park ("the Park") covers more than 600,000 acres in San Diego and Imperial Counties. The majority of the South Santa Rosa Mountains (Unit 2B), nearly 200,000 acres, and approximately 35,000 acres in Carrizo Canyon (Unit 3) are within the Park. The Park has conducted conservation efforts for the bighorn sheep since 1971. These include annual sheep counts at summer water sources in July, research on the interactions between bighorn sheep, mountain lions, and mule deer within the Park, and biennial helicopter surveys and capture and radio-collaring of bighorn sheep for monitoring purposes. The summer sheep counts have been conducted since 1971, and the remaining conservation efforts listed have taken place since 1992. These efforts are all expected to continue into the future.<sup>54</sup> The Park has not undertaken any conservation efforts precipitated by critical habitat, nor does it expect to in the future. The impacts presented here are therefore part of the baseline.
74. Since the listing of the bighorn sheep in 1998, these baseline management efforts have resulted in impacts of \$792,000 (applying a seven percent discount rate). Over the next 20 years, continuing these baseline activities is expected to have an impact of \$1.05 million or an annualized impact of \$99,500 (applying a seven percent discount rate).

### 2.2.2 BIGHORN INSTITUTE (UNIT 2A)

75. The Bighorn Institute has conducted conservation and recovery activities for the bighorn sheep since 1982. Its primary work is the operation of a captive breeding and population augmentation program near Palm Desert (Unit 2A). Radio-telemetry tracking studies and other research are also components of the Institute's work. The Institute is privately funded, and has an annual budget of \$400,000 (undiscounted). The full budget is designated for bighorn sheep-related conservation efforts. The Institute's work focuses on the sheep populations regardless of whether they are occupying critical habitat or other areas. The Institute did not change its activities or the focus of those activities in any way when critical habitat was designated in 2000, and does not expect to with designation resulting from the currently proposed rule. Pre-designation baseline impacts are estimated at \$5.91 million, discounted at seven percent. Post-designation baseline

<sup>53</sup> U.S. Department of Interior, Bureau of Land Management. Eastern San Diego County Proposed Resource Management Plan/Final Environmental Impact Statement, November 2007.

<sup>54</sup> Written and personal communication with Mark Jorgensen, Superintendent, Anza-Borrego Desert State Park, December 17 and 18, 2007.



impacts are \$4.53 million, discounted at seven percent (\$428,000 annualized).<sup>55</sup> There are no incremental impacts of critical habitat designation associated with the Bighorn Institute's activities.

### 2.2.3 CALIFORNIA DEPARTMENT OF FISH AND GAME (UNITS 2A AND 2B)

76. The California Department of Fish and Game (CDFG) has been involved in conservation efforts for the bighorn sheep since the early 1990s, prior to the species' listing.<sup>56</sup> CDFG owns land in Units 2A and 2B in the Carrizo Canyon, Peninsular Ranges, Magnesia, and Hidden Palms Ecological Reserves, and the Santa Rosa Mountains Wildlife Area. Conservation efforts include a wide variety of activities – population monitoring, habitat restoration and maintenance, and research - on these CDFG lands within proposed critical habitat, and on other land jurisdictions, often in partnership with other agencies.<sup>57</sup>
77. Population monitoring is accomplished via aerial helicopter survey and land-based surveys, combined with a capture and radio-collar program to track individual bighorn sheep.<sup>58</sup> The helicopter surveys and capture and radio-collar program are conducted in alternating years. A recent representative three-day capture effort had a total cost of \$58,970, covering helicopter services (pilot, fuel truck driver, fuel, and per diem), lodging, radio collars, and CDFG staff services (scientific aides, wildlife biologists, associate wildlife biologists, wildlife technicians, senior environmental scientists, and a veterinarian). The surveys cover established polygons encompassing all essential habitat as described in the Recovery Plan for Peninsular Bighorn Sheep. While the surveys typically require more helicopter time than the capture efforts (up to 35 hours versus approximately 21), no radio collar equipment purchases are necessary, and the total yearly cost for surveys is comparable to that for captures.<sup>59</sup>
78. In addition to these yearly efforts, aerial telemetry monitoring of collared bighorn sheep is conducted two to three times per month via a CDFG fixed-wing aircraft. Pilot and observer time, fuel, and maintenance costs total approximately \$7,000 per year. Ground monitoring of the collared bighorn sheep is undertaken by a scientific aid who investigates mortalities, and assists with habitat enhancement and restoration projects, in addition to the yearly survey work. Spending a total of approximately 800-900 hours per year, the scientific aid's compensation is approximately \$9,350.<sup>60</sup>
79. CDFG has recently made a request for Section 6 funds to develop and test an aerial sightability model that would allow CDFG to generate population estimates without the

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<sup>55</sup> Personal Communication, James DeForge, Executive Director, Bighorn Institute. December 6, 2007.

<sup>56</sup> Personal Communication, Steve Torres, Lead Staff Environmental Scientist, Wildlife Investigations Laboratory, California Department of Fish and Game. January 17, 2008.

<sup>57</sup> The state has management responsibility for wildlife across all land jurisdictions.

<sup>58</sup> Written Communication, Randy Botta, Associate Wildlife Biologist, Wildlife Species and Habitats Program, South Coast Region, California Department of Fish and Game. January 31, 2007.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

use of radio-collared bighorn sheep. Eventually, application of this model would allow CDFG to scale back on the number of bighorn sheep being collared for population estimation and reduce associated costs. The requested \$130,000 of Federal funding would be used over a three-year period, supplemented by some amount of CDFG funding for additional survey work.<sup>61</sup>

80. Additional habitat management activities relate to maintenance of water sources for the bighorn sheep. These include removal of the invasive tamarisk plant that can overtake watering areas for bighorn sheep, and maintenance of drinker tanks, pumps and water lines. Costs of the tamarisk removal efforts include staff time, and purchase of herbicide. A helicopter may be used to gain access to some remote locations. Currently \$40,000 worth of funding is available over the next two years for helicopter use for this purpose. While drinker maintenance costs vary, approximately \$2,000 per year is typically expended. In 2008, an additional expense of \$5,000 to repair a pump in Carrizo Canyon is expected.

#### 2.2.4 UNIVERSITY OF CALIFORNIA NATURAL RESERVE SYSTEM - BOYD DEEP CANYON DESERT RESEARCH CENTER (UNIT 2A)

81. The Regents of the University of California own the Boyd Deep Canyon Desert Research Center (Center) south of Palm Desert.<sup>62</sup> The land is managed as a protected research area and is not open to public access. Researchers and their interests, rather than land management objectives, drive activity at the site. The Center does not undertake any management specific to the bighorn sheep and does not anticipate doing so in the future.<sup>63</sup> Therefore no impacts are estimated for this area.

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<sup>61</sup> Ibid.

<sup>62</sup> Based on examination of available GIS information, and communication with the Boyd Deep Canyon Desert Research Center, and subsequent confirmation by the Service (written communication from Justin Shoemaker, Biologist, February 12, 2008), this land shown in the proposed rule as owned by the California State Lands Commission is in fact owned by the Regents of the University of California.

<sup>63</sup> Written communication from Dr. Allan Muth, Director in Residence, Boyd Deep Canyon Desert Research Center. February 6, 2008.

#### 2.2.5 SAN BERNARDINO NATIONAL FOREST (UNIT 1)

82. The U.S. Department of Agriculture, Forest Service, (USFS) owns 1,266 acres in Unit 1 of the proposed critical habitat designation. The area is remote, and contains a primarily chaparral ecosystem-type.<sup>64</sup> Because it is so remote, the USFS conducts little management in the area. The Forest Service has undertaken conservation efforts for the sheep related to grazing in the area (see section 2.3 below for discussion of impacts to grazing activities on Forest Service and other lands).

### 2.3 GRAZING

83. Cattle grazing has occurred on both U.S. Forest Service and BLM lands within the proposed critical habitat. On both types of land, the allowable level of grazing (cow/calf operations) has been or may be modified as a conservation effort for the bighorn sheep. The reasons and timing for modifying the level of allowable grazing are different for the two land types, with impacts on U.S. Forest Service land considered baseline, and those on BLM land considered incremental.

#### 2.3.1 U.S. FOREST SERVICE - SAN BERNARDINO NATIONAL FOREST (UNIT 1)

84. Following listing, authorization for grazing on Forest Service land was removed for a portion of an allotment in order to protect the bighorn sheep. In 2000, the Forest Service installed a quarter mile of fencing to separate the grazing allotment from bighorn sheep habitat and prevent cattle from coming into contact with sheep. The cost of fence installation was \$1,500 (undiscounted) in 2000. A total of 3,637 acres of the allotment were made unavailable for grazing to protect the bighorn sheep.<sup>65</sup> The impacts associated with precluded grazing in this area are considered baseline because the limitation was imposed soon after the species was listed.

#### 2.3.2 BUREAU OF LAND MANAGEMENT, EL CENTRO OFFICE (UNIT 3)

85. The BLM is in the process of revising its land management plan. Two of the alternatives being considered (including the BLM's preferred alternative) would exclude livestock grazing from all acres within existing critical habitat.<sup>66</sup> The BLM owns a total of 65,544 acres of land in several grazing allotments in its Eastern San Diego District. A relatively small portion of this area, 3,627 acres, or five percent, overlaps the proposed critical habitat designation. The area is actively grazed, and will be directly affected by a potential prohibition on grazing. The actively grazed portion totals 1,112 acres on two allotments, each with an existing permit set to expire in 2010.<sup>67</sup> The balance of the

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<sup>64</sup> Personal Communication with Anne Poopatanapong, Wildlife Biologist, San Bernardino National Forest. December 5, 2007.

<sup>65</sup> When critical habitat was designated in 2001, only 1,719 acres of the allotment were included in it. Rather than re-fence only the portion of the allotment that was within critical habitat, the Forest Service continued to not allow grazing on the full 3,637 acres, and expects this full area to be unavailable for grazing into the future, to protect the bighorn sheep.

<sup>66</sup> U.S. Department of Interior, Bureau of Land Management. Eastern San Diego County Proposed Resource Management Plan/Final Environmental Impact Statement, November 2007. pp. 2-70.

<sup>67</sup> Ibid, pp. 3-115 to 3-116.

allotments has not been actively grazed for a variety of reasons unrelated to the bighorn sheep for differing amounts of time (beginning at different times for different allotments from 1984 to 2004).<sup>68</sup> These potential impacts are considered incremental to critical habitat designation, because the boundaries to be delineated will follow the critical habitat designation boundary.

### 2.3.3 VALUATION OF LOST GRAZING OPPORTUNITIES

86. Forage values are expressed in Animal Unit Months (AUMs). One AUM is the amount of forage sufficient to feed a cow and calf pair for one month. Exhibit 2-2 provides the estimated AUMs on the relevant BLM allotments. The number of AUMs multiplied by the length of the grazing season in months, and the private grazing fee rate per AUM for California in 2007 of \$16.50, yields an estimate of the yearly losses in productivity due to prohibition of grazing in these areas.

**EXHIBIT 2-2 GRAZING ALLOTMENTS ON BLM LAND POTENTIALLY AFFECTED BY BIGHORN SHEEP CONSERVATION**

NAME	TOTAL ALLOTMENT ACRES	AUMS CURRENTLY SUPPORTED	DOLLAR VALUE (2007 \$)	ACRES WITHIN PROPOSED CRITICAL HABITAT	DOLLAR VALUE FOR AREAS WITHIN PROPOSED CRITICAL HABITAT (2007 \$)
McCain Valley - In-Ko-Pah	10,704	1,023	\$135,000	3,627	\$26,000
McCain Valley - Tierra Blanca	9,793	89	\$11,700		
<b>TOTAL</b>	<b>20,497</b>	<b>1,112</b>	<b>\$147,000</b>	<b>3,627</b>	<b>\$26,000</b>
Note: Totals may not sum due to rounding					

### 2.3.4 IMPACTS TO GRAZING ON SAN BERNARDINO NATIONAL FOREST (UNIT 1)

87. The total pre-designation impacts due to lost grazing on the San Bernardino National Forest, including the cost of fence installation are \$25,300 (applying a seven percent discount rate).
88. The total post-designation impacts from continued preclusion of grazing are estimated to be \$28,100 (applying a seven percent discount rate). The annualized impacts applying a seven percent discount rate are estimated to be \$2,650.

### 2.3.5 IMPACTS TO GRAZING ON BLM ALLOTMENTS (UNIT 3)

89. The draft Resource Management Plan for the El Centro Office considers eliminating grazing from bighorn sheep critical habitat. The relevant section of the draft plan states it will: "Eliminate all grazing from Peninsular bighorn sheep critical habitat by adjusting allotment boundaries to exclude critical habitat."<sup>69</sup> If this alternative is chosen, because it

<sup>68</sup> Written communication from Erin Dreyfuss, BLM, El Centro Grazing Program, December 17, 2007.

<sup>69</sup> U.S. Department of the Interior, Bureau of Land Management. November 2007. Eastern San Diego County Proposed Resource Management Plan and Final Environmental Impact Statement. Volume I. Page ES-28.

is based on the critical habitat, associated impacts to grazing activities would be incremental.

90. The total post-designation impacts due to lost grazing opportunities within the proposed critical habitat for actively grazed portions of the McCain Valley allotments total \$294,000 (applying a seven percent discount rate). The annualized impacts applying a seven percent discount rate are estimated to be \$27,800.<sup>70</sup>

#### 2.4 ADMINISTRATIVE COSTS OF SECTION 7 CONSULTATIONS FOR SPECIES MANAGEMENT AND GRAZING ACTIVITIES

91. Pre-designation administrative costs of section 7 consultations are quantified for one biological opinion for the BLM's California Desert Conservation Area Plan, conducted in 2002. The total cost of this consultation is estimated at \$29,300 (applying a seven percent discount rate).<sup>71</sup>
92. One incremental formal section 7 consultation is forecast for the Tribal HCP, expected to be completed in 2008. The total impact of the consultation for areas proposed for exclusion (Tribal areas of Unit 1) is estimated at \$14,600 (applying a three or seven percent discount rate), or an annualized cost of \$689 (applying a seven percent discount rate).
93. Additional costs for considering critical habitat are estimated for one formal consultation for the Coachella Valley MSHCP expected in 2008. The impacts, in areas considered for exclusion (Non-Tribal areas of Unit 1, and all of Unit 2A), are estimated at \$4,880 (applying a three or seven percent discount rate), or an annualized cost of \$461 (applying a seven percent discount rate).
94. Because no new areas outside of currently designated critical habitat are being proposed for designation, it is assumed that no re-initiation of consultations because of the designation of critical habitat will be necessary.

#### 2.5 SUMMARY OF IMPACTS TO SPECIES MANAGEMENT

95. The following tables present the total pre- and post-designation baseline impacts, and the incremental impacts to species management by unit. The pre-designation impacts stem from research and monitoring costs. The post-designation baseline impacts result from implementation of the Coachella Valley MSHCP, and continued species and habitat monitoring efforts by various entities. The incremental impacts result from implementation of the Tribal HCP, the potential for preclusion of grazing on BLM lands

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<sup>70</sup> Written communication from Erin Dreyfuss, BLM, El Centro Grazing Program, December 17, 2007.

<sup>71</sup> U.S. Fish and Wildlife Service. "Biological Opinion on Effects of the California Desert Conservation Area Plan on Peninsular Bighorn Sheep, Riverside and Imperial Counties, California," Formal Consultation # FWS-ERIV/IMP-2810.2, with the Bureau of Land Management. December 23, 2002. NOTE: As indicated above, we are awaiting further information on the management of BLM lands under this plan, and on implementation of the RPMs contained in the biological opinion.

within proposed critical habitat, and the costs of section 7 consultations that will consider critical habitat.

**EXHIBIT 2-3 PRE-DESIGNATION BASELINE IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$21,400	\$25,300
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$587,000	\$739,000
3. Carrizo Canyon	\$398,000	\$503,000
<b>TOTAL</b>	<b>\$1,010,000</b>	<b>\$1,270,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$598,000	\$658,000
<b>TOTAL</b>	<b>\$598,000</b>	<b>\$658,000</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$24,100	\$30,200
2A. North Santa Rosa Mountains	\$5,060,000	\$6,320,000
<b>TOTAL</b>	<b>\$5,090,000</b>	<b>\$6,350,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan		

## EXHIBIT 2-4 POST-DESIGNATION BASELINE IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$37,900	\$28,100	\$2,550	\$2,650
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$1,030,000	\$759,000	\$69,200	\$71,700
3. Carrizo Canyon	\$813,000	\$604,000	\$54,600	\$57,000
<b>TOTAL</b>	<b>\$1,880,000</b>	<b>\$1,390,000</b>	<b>\$126,000</b>	<b>\$131,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$499,000	\$369,000	\$33,500	\$34,800
<b>TOTAL</b>	<b>\$499,000</b>	<b>\$369,000</b>	<b>\$33,500</b>	<b>\$34,800</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains (30 years)	\$3,660,000	\$2,410,000	\$187,000	\$195,000
2A. North Santa Rosa Mountains (30 years)	\$55,800,000	\$37,300,000	\$2,960,000	\$3,070,000
<b>TOTAL</b>	<b>\$59,500,000</b>	<b>\$39,700,000</b>	<b>\$3,140,000</b>	<b>\$3,270,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan which include costs for land acquisition through 2037.				

**EXHIBIT 2-5 INCREMENTAL IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$398,000	\$294,000	\$26,800	\$27,800
<b>TOTAL</b>	<b>\$398,000</b>	<b>\$294,000</b>	<b>\$26,800</b>	<b>\$27,800</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$8,860,000	\$6,530,000	\$595,000	\$616,000
<b>TOTAL</b>	<b>\$8,860,000</b>	<b>\$6,530,000</b>	<b>\$595,000</b>	<b>\$616,000</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains (30 years)	\$2,440	\$2,440	\$164	\$230
2A. North Santa Rosa Mountains (30 years)	\$2,440	\$2,440	\$164	\$230
<b>TOTAL</b>	<b>\$4,880</b>	<b>\$4,880</b>	<b>\$328</b>	<b>\$461</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan which include costs for land acquisition through 2037.				

**2.6 SOURCES OF UNCERTAINTY**

96. There are important considerations that would potentially change the estimated impacts in this chapter.

- Several project modifications are not quantified in this analysis due to lack of sufficient publicly available information (e.g., bighorn sheep impact estimates for BLM's CDCA plan). This analysis therefore may underestimate the actual impacts resulting from project modifications.
- Impacts for each unit are estimated according to the published habitat boundaries of the October 2007 proposed rule and additional acreages specified by the Field Office on May 2, 2008. No publicly available maps were available for the additional acreage, so there is some uncertainty involved in estimating impacts for the expansions of the units; the impacts estimated for these expansions are based on descriptions that were provided to stakeholders, rather than actual maps. The total estimated impacts may be inaccurate to the extent that these descriptions of added proposed critical habitat were incorrect.



## CHAPTER 3 | POTENTIAL ECONOMIC IMPACTS TO DEVELOPMENT-RELATED ACTIVITIES

### 3.1 INTRODUCTION

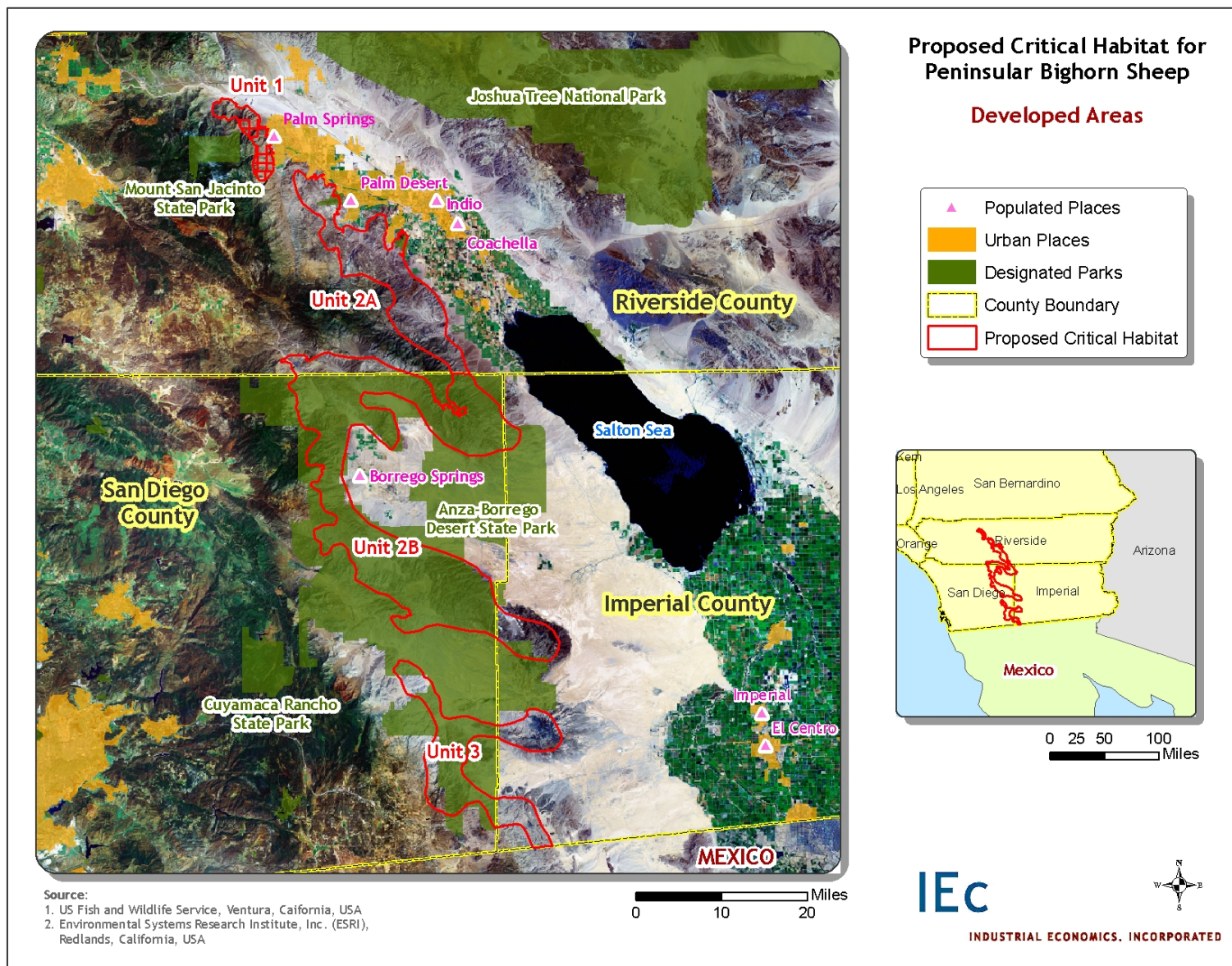
97. The proposed rule identifies development and expansion of urban areas as one of the important sources of direct and indirect threats to the bighorn sheep in the study area. These threats primarily are in the form of habitat degradation and fragmentation resulting from increases in residential and commercial land development within and near the range of the bighorn sheep. Consequently, the Service has requested project modifications for development-related activities to afford protection to the species and its habitat.
98. This chapter describes how conservation activities to protect the sheep and its habitat may affect land, housing, and commercial development in the currently proposed critical habitat for the bighorn sheep. In this analysis, development-related impacts are not expected for Federal or state-owned lands because most of these lands are either already in conservation management or belong to National or State Parks. Private owners of parcels containing a Federally listed species, or designated as critical habitat for a listed species, may face (or perceive) certain land use restrictions that preclude, restrict, delay, or increase the cost of development on some or all of the parcel. Land use and development restrictions may also lead to a reduction in property values. Alternatively, in some cases, property value may also increase if people favorably perceive the proximity of the property to the critical habitat of an endangered species. This chapter discusses these and similar issues related to land development, and quantifies where possible, the potential economic impacts resulting from sheep conservation efforts.

#### 3.1.1 PROXIMITY OF PROPOSED CRITICAL HABITAT TO DEVELOPING AREAS

99. As shown in Exhibit 3-1 the proposed critical habitat occupies areas in three counties of California: Riverside, San Diego and Imperial. The San Jacinto Mountains (Unit 1) and North Santa Rosa Mountains (Unit 2A) are located in Riverside County; the majority of South Santa Rosa Mountains (Unit 2B) and Carizzo Canyon (Unit 3) are in eastern San Diego county. The eastern edges of the South Santa Rosa Mountain (Unit 2B) and the Carizzo Canyon (Unit 3) proposed critical habitat units are in Imperial County. Exhibit 3-2 presents the 2006 estimate of populations and percentage growth rates for the three counties. San Diego County has the largest population and population density among the three counties affected by the proposed rule. However, most of the population and growth potential is concentrated in the western part of San Diego County.

EXHIBIT 3-1

DEVELOPED AREAS IN THE VICINITY OF PROPOSED CRITICAL HABITAT



100. The current and proposed critical habitat areas are in the eastern part of the county, where a majority of the land is not developable. Over 90 percent of the land within the critical habitat designation is State park land or Bureau of Land Management wilderness area. Only a few small housing developments near Borrego Springs may exist within or near the critical habitat borders. Thus, critical habitat will most likely have limited effects on the population and regional economy of San Diego County.
101. Riverside County is almost as populated as San Diego County; however, its population density is much lower. This has enabled substantial population growth in Riverside County in the last few years. As shown in Exhibit 3-2, the estimated growth rate since 2000 is 31.2 percent for Riverside County, which is more than four times the California state average of 7.5 percent. Because of this high growth, there has been considerable growth in the number of housing units in the county. The county is transitioning from an agricultural economy to a retirement and tourism-based economy. Most of the high growth areas in Riverside county (e.g., areas in the vicinity of Palm Springs, Palm Desert, Cathedral City, La Quinta, Rancho Mirage) lie adjacent to the eastern edges of Units 1 and 2A. Developers are planning resort and housing developments near the base of the mountains and in the foothills, encroaching on bighorn sheep habitat. Because of this intense development pressure, most of the potential impacts of the critical habitat designation for the bighorn sheep are likely to occur in Riverside County, as opposed to the other counties.
102. Imperial County is sparsely populated, and similar to San Diego County, the economic activity within the proposed critical habitat designation in Imperial County is currently limited. A few small housing developments exist near Desert Shores on the Salton Sea. However, Imperial County's large population growth (12.6 percent) may increase development pressures in areas adjacent to or within the proposed critical habitat designation. In addition, the increasing recreational use of land in and surrounding the eastern portions of the South Santa Rosa Mountains unit (Unit 2B) and the Carrizo Canyon unit (Unit 3) may exert pressures for development. The type of recreation that is growing in this area is predominantly off-road vehicle racing, a type of recreation that requires substantial supporting infrastructure. Increased demand for this infrastructure may increase development activity in these areas.

**EXHIBIT 3-2 2006 POPULATION ESTIMATES FOR COUNTIES AFFECTED BY PROPOSED RULE<sup>72</sup>**

COUNTY	POPULATION	POPULATION DENSITY (PER SQ. MILE)	PERCENT GROWTH SINCE 2000
Riverside	2,026,803	281.2	31.2%
San Diego	2,941,454	700.4	4.5%
Imperial	160,301	38.4	12.6%

<sup>72</sup> Source: United States Census Bureau. State and County QuickFacts. <http://quickfacts.census.gov/qfd/states/>. Website last accessed on December 04, 2007.

### 3.2 DEVELOPMENT ACTIVITIES

#### 3.2.1 TYPICAL CONSERVATION MEASURES FOR DEVELOPMENT PROJECTS IN PROPOSED CRITICAL HABITAT

103. New development activities have the potential to impact the bighorn sheep in several ways. As a result, the Service has been involved with several residential and commercial development projects in Riverside County in the past. There have been four section 7 consultations related to development projects since the listing of the species in 1998. Exhibit 3-3 summarizes these consultations.<sup>73, 74, 75, 76</sup> To date, only the Mirada and Stone Eagle projects have been built. However, the consultations on the proposed Travertine and Shadowrock developments provide guidance in defining what project modifications the Service recommends for development-related activities.

**EXHIBIT 3-3 SUMMARY OF DEVELOPMENT-RELATED FORMAL CONSULTATIONS IN THE PRE-DESIGNATION PERIOD (1999 - 2007)**

FEDERAL AGENCY	DEVELOPER	PROJECT NAME	LOCATION	NEAREST PROPOSED CRITICAL HABITAT UNIT	CONSULTATION DATE
US Army Corps of Engineers	MCO Properties, Inc.	Mirada	City of Rancho Mirage	Unit 2A	July, 1999
US Army Corps of Engineers	Destination Development Corporation	Stone Eagle	City of Palm Desert	Unit 2A	November, 2003
Bureau of Land Management	Travertine Corporation	Travertine	City of La Quinta	Unit 2A	December 2005
US Army Corps of Engineers	Shadowrock Development Corporation	Shadowrock	City of Palm Springs	Unit 1	April, 2007

104. The Service has recommended a variety of conservation measures for protection of the bighorn sheep and its habitat. Exhibit 3-4 presents the typical recommendations that have been suggested and identifies those conservation measures that have been quantified in

<sup>73</sup> U.S. Fish and Wildlife Service. "Biological Opinion on MCO Properties, Mirada," Formal Consultation # 1-6-99-F-006, with the US Army Corps of Engineers. July 07, 1999.

<sup>74</sup> U.S. Fish and Wildlife Service. "Biological Opinion on Stone Eagle Project," Formal Consultation # FWS-ERIV-3080.2, with the US Army Corps of Engineers. November 07, 2003.

<sup>75</sup> U.S. Fish and Wildlife Service. "Biological Opinion on Travertine Project," Formal Consultation # FWS-ERIV-2735.3, with the Bureau of Land Management. December 07, 2005.

<sup>76</sup> U.S. Fish and Wildlife Service. "Biological Opinion on Shadowrock Development," Formal Consultation # FWS-ERIV-4993.1, with the US Army Corps of Engineers. March 14, 2007.



this analysis. Sufficient information is not available for quantification of other project modifications listed in the second column in Exhibit 3-4.

**EXHIBIT 3-4 TYPICAL CONSERVATION MEASURES REQUESTED BY THE SERVICE FOR AVOIDING AND MINIMIZING DEVELOPMENT-RELATED IMPACTS IN AREAS OCCUPIED BY PBS**

QUANTIFIED CONSERVATION MEASURES	UNQUANTIFIED CONSERVATION MEASURES
<ul style="list-style-type: none"> <li>• Establishment of funds to be used for species conservation purposes</li> <li>• Purchase and/or management of conservation lands or transfer of ownership of lands to offset loss of habitat in project area</li> <li>• Special fencing to prevent interaction between sheep and people</li> </ul>	<ul style="list-style-type: none"> <li>• Preservation of open space in critical habitat areas (forego development)</li> <li>• Funding and arranging educational programs for clients and residents of development projects</li> <li>• Installation of artificial water sources, security gates, and special lighting systems</li> <li>• Development of wildlife corridors and escape terrain to facilitate sheep movement and prevent habitat fragmentation</li> <li>• Implementation of special vegetation management plans (e.g., clearing plants toxic to sheep)</li> <li>• Importing offsite land filling material only from sites certified by the Service or an appointed agency</li> <li>• Restrictions on location and timing of construction activities</li> <li>• Participation in multi-species recovery plans to offset some impact of the project</li> </ul>

**3.2.2 METHODOLOGY FOR ESTIMATING DEVELOPMENT-RELATED IMPACTS**

105. Impacts to development vary by activity type, location and the time-period of analysis. This analysis utilizes the best publicly available information to develop location-specific methods for estimating potential future impacts to entities involved in development. For example, for estimating future impacts in Units 1 and 2A, information from the MSHCP is utilized. Similarly, for areas within Unit 1 that are owned by the Agua Caliente Tribe and are proposed for exclusion, information provided by the Tribe is used to estimate economic impacts. However, when specific information is not available, this analysis relies on GIS-based analysis to quantify potential impacts to developable lands.
106. For estimating future impacts related to development, it is assumed that all privately held lands can be developed if they are accessible by existing roads or are known to have development potential. Private lands are identified through GIS analysis of land ownership information. Accessibility was determined by analysis of maps of existing roads and private lands. This procedure indicates the parcels that are unlikely to be developed. Furthermore, because most private lands are intermixed with public lands, it is also assumed that development on private lands may require access through public

lands, which may provide a federal nexus for consultation and the implementation of bighorn sheep conservation measures.

107. Based on the conservation measures listed in Exhibit 3-4, this analysis assumes that the following types of impacts may be borne by future development projects:

- provision of an equivalent area offset (i.e., mitigation ratio of 1:1) of new conservation lands within the same proposed critical habitat Unit to mitigate the impact of developments.
- installation of barriers such as fencing and/or security gates;
- establishment of funds for management of the sheep.

108. Because it is not possible to predict the number of future projects, this analysis instead estimates the per-acre cost of development project modifications and applies it uniformly to the developable lands under consideration. To estimate the per-acre costs, this analysis relies on information pertaining to section 7 consultations for the Travertine, ShadowRock, and Stone Eagle development projects whose planned project areas are also available as GIS layers for this analysis.<sup>77</sup> Based on these data and additional data on land values applicable to the development area under consideration, the following steps are undertaken to estimate the per-acre impact:

**A. Estimate the per-acre costs associated with conservation funding**

- i. Estimate the total project area for the four development projects listed in Exhibit 3-3.
- ii. Calculate the total conservation fund payments identified by the Service for these projects.
- iii. Calculate the average cost of conservation funding per acre of development.

**B. Estimate the per-acre costs associated with fencing**

- iv. Using available GIS data, estimate the total perimeter of all project areas.
- v. Calculate the average fencing length per acre of development (i.e., ratio of (i) and (iv)).
- vi. Calculate the average cost of fencing per acre of development, assuming a fixed cost of fencing per linear feet.

**C. Estimate the per-acre value of land to be conserved**

- vii. Estimate the total acres of private land that are available for development based on accessibility considerations.
- viii. Assume that an equivalent amount of private land will be secured outside project footprint (but within the unit) to mitigate development impacts.

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<sup>77</sup> GIS data are not available for the project developed by MCO Properties.

- ix. Estimate the per-acre cost of land that will need to be conserved to offset development on available lands.

### 3.2.3 METHODS FOR UNITS 1 AND 2A

- 109. The San Jacinto Mountains (Unit 1) and North Santa Rosa Mountains (Unit 2A) are managed by the MSHCP. Therefore, future impacts in these units are estimated based on the per-acre development mitigation fee that will be required of all development in those units, and the amount of acres of developable land identified by the MSHCP as available for development in Units 1 and 2A.
- 110. Future impacts on Tribal lands that have been proposed for exclusion are calculated based on economic analysis conducted by the Tribe specifically to estimate the impact of their Habitat Conservation Plan.

### 3.3 PRE-DESIGNATION IMPACTS (1998 - 2007)

- 111. The pre-designation period for this analysis extends from the listing of the species in 1998 to the present year (2007). Pre-designation impacts that are associated with development are estimated for two development projects: the Mirada Project owned by MCO Properties and Stone Eagle owned by Destination Development Corporation. Both these projects are located in the vicinity of proposed Unit 2A (North Santa Rosa Mountains). The quantified impacts to these entities resulted from the total amount provided to conservation funds and from installation of fences.
- 112. Project development acres and funding provided to conservation funds are estimated from the Service's biological opinions for these projects. For the Stone Eagle development project, GIS data are available to calculate the fencing length. Because no GIS data are available for the Mirada Project, the average length of fencing is estimated based on the steps listed in Step B of the methodology presented above for estimating future development impacts.
- 113. In addition to these project modification impacts, the administrative costs of the four consultations listed in Exhibit 3-3 also contribute to the total economic impacts in the pre-designation period.
- 114. As shown in Exhibit 3-5, the total pre-designation impacts are estimated to be \$8.25 million dollars (discounted at seven percent). Most of these impacts are associated with Unit 2A (North Santa Rosa Mountains) which overlaps with the two development projects. Impacts estimated for Unit 1 (San Jacinto Mountains) are only due to section 7 consultation costs.

## EXHIBIT 3-5 DEVELOPMENT-RELATED PRE-DESIGNATION ECONOMIC IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0
3. Carrizo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$14,900	\$15,500
2A. North Santa Rosa Mountains	\$7,310,000	\$8,230,000
<b>TOTAL</b>	<b>\$7,330,000</b>	<b>\$8,250,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan.		

**3.4 POST-DESIGNATION BASELINE IMPACTS (2008 - 2027)**

115. This section discusses the future baseline impacts related to development activities. Baseline impacts are expected in the San Jacinto Mountains unit (Unit 1) and in the North Santa Rosa Mountains unit (Unit 2A). Units 1 and 2A are mostly within the Santa Rosa and San Jacinto MSHCP conservation areas, while a small fraction of the critical habitat also lies in the Snow-Creek/Windy Point and Whitewater conservation areas.

**3.4.1 OVERVIEW OF DEVELOPMENT-RELATED PROVISIONS SPECIFIED IN THE MSHCP**

116. In order to minimize the effects of any kind of developmental activity on the areas occupied by the sheep and/or other species, the MSHCP identifies several objectives to ensure that development within and at the edges of the Conservation Areas does not compromise the conservation needs of any species covered by the plan. Existing conservation lands within the MSHCP are assigned three levels. On conservation Level 1 lands, all development is precluded, except to provide access to private inholdings within the Wilderness. On conservation Level 2 and Level 3 lands some development may occur on existing conservation lands. However, new development will require section 7 consultations for Federally owned existing conservation lands, or will be subject to the appropriate permitting processes for state owned lands. For all other existing conservation Level 2 and Level 3 lands owned by other local permittees or private entities,



development will only be allowed through a MSHCP amendment, and will need to be consistent with the conservation objectives of the plan.

117. The MSHCP has stipulated land use adjacency guidelines that need to be followed by all development within and near all the conservation areas.<sup>78</sup> These guidelines provide that the existing quantity and quality of runoff to conservation areas should not be degraded and that storm water systems and land use activities prevent the release of any material to conservation areas that may degrade the quality of the conservation areas. Invasive or exotic species cannot be used for landscaping within or adjacent to the conservation areas. Light shielding, noise reduction, installation of special barriers (e. g., fences, gates) to minimize contact of bighorn sheep with humans, and restriction on introduction of any manufactured slopes associated with development projects are the other listed guidelines.
118. New development in any of the three conservation areas overlapping with the proposed critical habitat for the sheep are also required to adhere to the following criteria:<sup>79</sup>
  - Development shall be clustered in one area of a site as close as possible to existing development.
  - Development on alluvial fans shall be sited at the lowest possible elevation on the site and shall avoid the mouth of any canyon.
  - Development shall be sited a minimum of a quarter (0.25) mile from known bighorn sheep water sources identified on a reference map except where topographic features shield the view of the water source and access to it from proposed development or trails, thereby minimizing potential impacts to the bighorn sheep's ability to access water.
  - Development shall be conditioned to prohibit the construction of trails in Essential bighorn sheep Habitat unless approved through a Minor Amendment with Wildlife Agency concurrence.
  - Development shall not preclude Habitat connectivity or movement. Determination of whether Habitat connectivity or movement is precluded shall be made by the Lead Agency for the development based on factual data provided by the Reserve Management Oversight Committee,<sup>80</sup> Reserve Management Unit Committee, Wildlife Agencies, or other source.
119. In the Santa Rosa and San Jacinto conservation areas, which contain most of the proposed critical habitat within Units 1 and 2A, special provisions have also been incorporated for several areas for which development plans already exist or which have a strong potential for development. Most of these provisions are derived from the conservation measures,

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<sup>78</sup> Coachella Valley Association of Governments (CVAG), 2007. Final Recirculated Coachella Valley MSHCP; pp. 4-178 to 4-183.

<sup>79</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP; pp. 4-23, 4-25, 154.

<sup>80</sup> The committee established by the CVCC to provide biological, technical and operational expertise for implementation of the MSHCP, including oversight of the MSHCP Reserve System, as described in Section 6.1.3 of the MSHCP.

and Reasonable and Prudent Measures (RPM) set forth by the Service in its biological opinions on the section 7 consultations initiated in the past (e.g., biological opinions on the MCO Properties, Stone Eagle, Travertine, and Shadowrock development projects).

#### 3.4.2 ESTIMATION OF POST-DESIGNATION IMPACTS TO UNITS 1 AND 2A

120. Excluding lands owned by the Tribe, all other areas relevant for the development analysis within Unit 1 and 2A lie within the Conservation areas identified in the MSHCP. The MSHCP plan identifies 3,867 acres within the proposed critical habitat where disturbance from development may occur. Additionally, it identifies another 181 acres as authorized for development; these acres are not considered in this analysis because they are located outside the proposed critical habitat.<sup>81</sup> Future development projects will incur costs due to the special provisions that are discussed in the plan for specific project areas.
121. The MSHCP stipulates that all future development within Conservation Areas will be subject to a development mitigation fee of \$5,730.<sup>82</sup> Permittees are not allowed to charge additional amounts above and beyond this fee. Based on the Service's assumption that the MSHCP will be implemented and will preclude the need for section 7 consultations, this analysis assumes that the development mitigation fee is the only foreseeable impact associated with development in Units 1 and 2A. It is also assumed that all of the available acres for development will be developed in the future.
122. The biological opinion for the Mirada project states that MCO Properties pay \$32,000 into a sheep conservation fund for perpetuity.<sup>83</sup> This cost is included in the estimation of post-designation impacts for Unit 2A (North Santa Rosa Mountains).
123. The total future economic impact associated with developable areas within Units 1 (San Jacinto Mountains) and 2A (North Santa Rosa Mountains) are estimated to be \$1.6 million and \$11.3 million (discounted at seven percent), respectively.<sup>84</sup>

#### 3.4.3 ESTIMATION OF POST-DESIGNATION IMPACTS TO UNITS 2B AND 3

124. Most of the privately held developable lands in Units 2B (South Santa Rosa Mountains) and 3 (Carrizo Canyon) lie in remote areas where minimal development currently exists. Moreover, most of Units 2B and 3 lies within the Anza-Borrego State Park. Information from the Anza-Borrego State Park, indicates that the private inholdings in Unit 2B that are located within the Anza-Borrego State Park in San Diego County are not likely to be developed in the future.<sup>85</sup> Accordingly, this analysis assumes that the development of these inholdings is unlikely. However, as discussed above, private lands that are at the

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<sup>81</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP; Section 9.8.4.1, pp.9-258.

<sup>82</sup> CVAG, 2007. Final Recirculated Coachella Valley MSHCP; Section 9.8.4.1, pp.9-258.

<sup>83</sup> U.S. Fish and Wildlife Service. "Biological Opinion on MCO Properties, Mirada," Formal Consultation # 1-6-99-F-006, with the US Army Corps of Engineers. July 07, 1999.

<sup>84</sup> Because the exact overlap of Units 1 and 2A with the conservation areas are not known, this analysis distributes the total impacts to Units 1 and 2A in proportion to the areas occupied by these Units.

<sup>85</sup> Personal communication with Mark Jorgensen, Anza-Borrego Desert State Park, December 18, 2007.

edge of the Park and accessible by roads, or close to existing development (e.g., City of Borrego Springs) are considered to be developable lands. Also, as discussed above, private land within proposed critical habitat in Imperial County may face development pressures due to the increasing recreational use of off-road vehicles in the area. As discussed in Section 3.2.2, since most private lands in these areas are intermixed with public lands, it is also assumed that development on private lands may require access through public lands, which may provide a federal nexus for consultation and the implementation of bighorn sheep conservation measures.

125. According to the estimates provided by Anza-Borrego State Park, the average value of developable lands in areas within San Diego County is estimated to be \$15,000/acre. The value of developable lands within Imperial County is estimated to be about \$7,500.<sup>86</sup>
126. Based on these average land values and the methodology outlined above in section 3.2.2, the total post-designation baseline economic impacts associated with development for Units 2B and 3 are estimated to be \$21.8 million and \$26.5 million (discounted at seven percent), respectively.
127. Exhibit 3-6 summarizes the post-designation baseline impacts. Future impacts associated with Units 2B and 3 are expected to be the highest; future impacts attributable to Unit 1 are expected to be the lowest. Conservation impacts to development within the Tribal HCP are incremental impacts, since the Tribal HCP was created as a result of critical habitat designation.

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<sup>86</sup> Personal communication with Manager, Academy Rentals, Ocotillo, California, on December 17, 2007.

## EXHIBIT 3-6 DEVELOPMENT-RELATED POST DESIGNATION BASELINE ECONOMIC IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$29,400,000	\$21,800,000	\$1,980,000	\$2,060,000
3. Carrizo Canyon	\$35,800,000	\$26,500,000	\$2,400,000	\$2,500,000
<b>TOTAL</b>	<b>\$65,200,000</b>	<b>\$48,200,000</b>	<b>\$4,380,000</b>	<b>\$4,550,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$2,130,000	\$1,580,000	\$143,000	\$149,000
2A. North Santa Rosa Mountains	\$15,300,000	\$11,300,000	\$1,030,000	\$1,070,000
<b>TOTAL</b>	<b>\$17,500,000</b>	<b>\$12,900,000</b>	<b>\$1,170,000</b>	<b>\$1,220,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				

**3.5 INCREMENTAL IMPACTS (2008 - 2027)**

128. In this analysis, economic impacts are identified as incremental impacts if they are a direct result of critical habitat designation. The only incremental development-related impacts associated with the proposed critical habitat designation are expected to be due to efforts undertaken by the Agua Caliente Tribe to implement the Habitat Conservation Plan. This plan is a direct result of the proposed critical habitat designation.

**3.5.1 AGUA CALIENTE BAND OF CAHUILLA INDIANS TRIBE**

129. The Unit 1 lands proposed for exclusion are being managed by the Tribe in a way that affords some conservation benefit to the sheep and are within the plan area of the draft Tribal Habitat Conservation Plan (HCP).<sup>87</sup> Hence, the Service indicates in the proposed rule that the acres owned by the Tribe in Unit 1 be excluded from the final critical habitat designation.

<sup>87</sup> United States Fish and Wildlife Service, 2007. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*) and Proposed Taxonomic Revision; Proposed Rule. Federal Register, Vol. 72, No. 195, pp. 57755.

130. This analysis utilizes information from the Tribe to estimate impacts on their lands. Hence, it utilizes information from the economic analysis conducted by the Tribe to evaluate the impacts arising out of reduced development in some areas.
131. The Tribe first estimated the number of residential units that could be developed on allotments, based on multiple criteria, including the slope of the land. Next, the Tribe estimated the number of residential units that would be allowed on the allotments under the Tribal Habitat Conservation Plan, which restricts development to protect the bighorn sheep. The decrease in the number of residential units is multiplied by the estimated per-acre value of the developable land to arrive at a total economic impact for each allotment. The range of economic impacts for allotments varies between \$4,250 and \$190,000.
132. Based on the results of the Tribe's analysis and a GIS layer mapping the location of the allotments owned by the Tribe, this analysis identified the allotments for which development-related impacts are quantified, and which are within proposed critical habitat Unit 1 (San Jacinto Mountains). The economic impact due to reduced development opportunities on these Tribal lands within Unit 1 is then estimated as the sum of the economic impacts estimated for these allotments. This impact amounts to \$368,000 (discounted at seven percent).
133. In addition to the impact arising from lost development opportunities, the Tribe also identified that approximately \$2.5 million will be spent in the future for installation of an 8 feet high fence on all properties adjacent to sheep habitat. Other un-quantified burdens on properties adjacent to sheep habitat include restrictions on the types of lighting, water feature design, and plants that can be used for landscaping.
134. Based on the best available quantitative data, this analysis therefore estimates that the total economic impact to the Agua Caliente Tribe arising out of sheep conservation efforts specifically to minimize the impact of development is approximately \$1.78 million (discounted at seven percent). Exhibit 3-7 summarizes the incremental impacts.

## EXHIBIT 3-7 DEVELOPMENT-RELATED POST DESIGNATION INCREMENTAL ECONOMIC IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$2,410,000	\$1,780,000	\$162,000	\$168,000
<b>TOTAL</b>	<b>\$2,410,000</b>	<b>\$1,780,000</b>	<b>\$162,000</b>	<b>\$168,000</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				

**3.6 SOURCES OF UNCERTAINTY**

135. There are several important caveats to our analysis of development impacts, as follows:

- The analysis uses the best readily available GIS information to calculate the acreage of developable land which was then refined based on other available information. These estimates may over- or understate the actual lands available for development. For example, the estimated acreage of developable lands may be overstated because these areas may be less suited to development due to specific characteristics of individual parcels that have not been considered for purposes of this analysis (i.e., steep slope, access issues) or the development does not have a federal nexus.
- The assumption that impact to all developable lands within critical habitat can be offset by provision of conservation lands outside the project area may not be true for all areas. Some developable lands may be too crucial for sheep conservation and recovery, and may not be considered replaceable. In such cases either development would have to be foregone on those lands, or more stringent conservations measures may be enforced.

- It is assumed that the only foreseeable impacts in Units 1 and 2A are related to a fixed development mitigation fee. This fee is expected to increase over time. Therefore, development impacts estimated for Units 1 and 2A may be underestimated in this analysis.
- Several project modifications that have been required in the past and may be required in the future are not quantified in this analysis due to lack of sufficient information. This analysis therefore may underestimate the actual impacts resulting from project modifications.
- The estimates of development potential described in Section 3.2.2 assume that past consultations are a reasonable basis for predicting future project modifications. This may not be true if the Service suggest different conservation measures in the future. Moreover, the average costs calculated per-acre may underestimate or overestimate the actual per-acre development costs in the future.

## CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO MINING-RELATED ACTIVITIES

136. This chapter describes the economic impacts due to mining operation modifications and preclusion of mining from areas within proposed critical habitat for the bighorn sheep. As is the case throughout this analysis, the impacts described in this chapter are exclusively due to the 2007 proposed critical habitat. Impacts from the 2001 critical habitat designation, though substantial, are not due to the 2007 proposed designation. Pre-designation baseline impacts, and forecast post-designation impacts are quantified for Unit 3 in the proposed designation. This chapter also includes a distributional analysis that estimates how the regional economy would be affected if a proposed mine within the study area is not allowed to open. The distributional analysis is a simplified analysis of what would happen to the regional economy. This analysis does not measure economic welfare losses; the additional regional impacts predicted in this model are not added with the other impacts described in the chapter.

### 4.1 MINING ACTIVITIES

137. The Ocotillo gravel mining area is near critical habitat in Northwestern Imperial County. This area is located along the southwestern edge of the Coyote Mountains and the eastern edge of the Jacumba Mountains, partially within and near Unit 3. The Bureau of Land Management (BLM) permits mining in this region, which establishes a Federal nexus for section 7 consultations for the mining operations.
138. The operations of all mining companies in the Octotillo mining group (a consortium of individual mining companies) were affected by the 2001 designation of critical habitat. The 2001 critical habitat designation included a haul road for removal of gravel product from the site. As a result, a new haul road outside of the 2001 critical habitat area was built in 2005. The mining companies that paid for the new road and have since been using it incurred construction costs and continue to incur additional costs for using this longer road.
139. However, 2007 proposed critical habitat does not include the haul road that was in the 2001 critical habitat. As a result, the costs associated with the construction and use of the new haul road are distinct from the 2007 proposed critical habitat. These costs are presented in Exhibit 4-1 to catalog the substantial costs faced by mining companies under the 2001 critical habitat. The impacts included as part of this report and listed in Exhibits 4-2 and 4-3 are related to the 2007 proposed critical habitat.



140. The 2007 proposed critical habitat in Carrizo Canyon (unit 3) includes a proposed limestone mine owned by Creole Corporation, a subsidiary of Texas Industries, Inc. (TXI), and a mine owned and operated by US Gypsum.<sup>88</sup> (which is separate from the Ocotillo mining group). There have been no historical project modifications for the US Gypsum mine, and none are anticipated at this time.<sup>89</sup> The following sections detail the pre- and post-designation impacts of potential modifications for the Creole mine.
141. Creole Corporation holds patented and unpatented mining claims for limestone within proposed Unit 3 in Imperial County.<sup>90</sup> Creole Corporation estimates that the proven and probable limestone reserves on the patented claims could generate 1.8 million tons of material per year, and \$17.4 billion (undiscounted) of cement product over 80 years.<sup>91</sup> It estimates that an additional \$43 billion (undiscounted) could be generated from the unpatented claims 80 to 192 years in the future.<sup>92</sup> Other mines have and do operate within bighorn sheep habitat (though not within the currently proposed critical habitat), so it is reasonable to assume that Creole Corporation's claims may be mined in the future, but the specific plans including timing and locations of mine operations make the estimated impacts to Creole Corporation uncertain. Previous section 7 consultations serve as a basis for estimating potential impacts associated with conservation efforts related to mining as described below.

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<sup>88</sup> The US Gypsum Mine is not part of the Ocotillo Mining Group mines that were affected by the 2001 critical habitat designation, but are not included within the current proposed designation.

<sup>89</sup> Personal communication with Buzz Todd, Bureau of Land Management Geologist, February 12, 2008.

<sup>90</sup> Patented mining claims are owned by private mining companies. Unpatented mining claims are held by companies and give them the right to mine the land, but the land is owned by a Federal agency (the BLM in this case).

<sup>91</sup> Written communication from Gregory A. Knapp, Environmental Manager, Western Region. TXI Creole Corporation. Dated March 24, 2008; and Written communication from Gregory A. Knapp, Environmental Manager, Western Region. TXI Creole Corporation. Dated March 13, 2008.

<sup>92</sup> Written communication from Gregory A. Knapp, Environmental Manager, Western Region. TXI Creole Corporation. Dated March 13, 2008.

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**EXHIBIT 4-1 IMPACTS FROM THE 2001 CRITICAL HABITAT DESIGNATION**

The 2001 Critical Habitat Designation affected several companies in the Ocotillo Mining Group. These companies either had existing operations within critical habitat, used a haul road within critical habitat, or both.<sup>1</sup> As a result, these companies incurred administrative, management, and other compliance costs to comply with critical habitat regulations. In 2005, these companies paid for the construction of an alternate haul road outside of critical habitat. Due to their use of this new, longer haul road, these companies incur substantially higher haul costs. All of these costs are listed in this Exhibit. However, these costs are not included as part of the economic analysis of the 2007 proposed critical habitat because the land where activities (i.e., the haul road location) were affected by the 2001 critical habitat is not included in the 2007 proposed critical habitat.

The Ocotillo Mining Group consists of the Granite Construction Company, Pyramid Construction, Val-Rock, Inc., Cal-Grade, Inc., and Imperial County Sand and Gravel.

- The Ocotillo Mining Group has estimated total administration costs of \$141,000 per year since the 2001 critical habitat designation.<sup>2,3,4</sup>
- In 2006 and 2007, Pyramid Construction and Granite Construction Company estimated they spent a combined \$52,000 on compliance activities such as surveys and land offset purchases.<sup>2,3,4</sup>
- The Ocotillo Mining Group spent approximately \$1.31 million in 2005 to build the new haul road.<sup>2,5</sup>
- The Ocotillo Mining Group incurs approximately \$1.45 million per year in additional haul costs from using the haul road that was built in 2005.<sup>2,5</sup>

## Notes:

- (1) Personal communication with Buzz Todd, Bureau of Land Management Geologist, February 12, 2008.
- (2) Personal communication with Ocotillo Mining Group representative. November 15, 19, and 27, 2007.
- (3) Written communication from Barabara Goodrich-Welk on behalf of Pyramid Construction, January 9, 2008.
- (4) Written communication from Scott Castro, JMBM LLP, February 7, 2008.
- (5) Written communication from Kelly Shapiro, JMBM LLP, February 12, 2008.

**4.2 PRE-DESIGNATION IMPACTS**

142. The pre-designation impacts to mining in the study area are from consultations in 1998 and 2003, and from land offset purchases required by the 2003 consultation.<sup>93</sup> Exhibit 4-2 summarizes these pre-designation baseline impacts.

**EXHIBIT 4-2 PRE-DESIGNATION BASELINE MINING IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%
<b>PROPOSED CRITICAL HABITAT</b>		
3. Carrizo Canyon	\$79,200	\$98,400
<b>TOTAL</b>	<b>\$79,200</b>	<b>\$98,400</b>

**4.3 POST-DESIGNATION BASELINE IMPACTS**

143. The full geographic extent of the proposed 2007 critical habitat designation is within the boundaries of the 2001 critical habitat designation; impacts associated with the 2001 critical habitat designation that are not also within the currently proposed designation are not due to the proposed 2007 designation. While the costs discussed in Exhibit 4-1 may continue to be incurred by the mining companies, these costs are not attributable to the 2007 proposed critical habitat.
144. Post-designation baseline impacts associated with the TXI Creole Corporation limestone mine are expected for Unit 3. Some of TXI's claims are located on BLM land. A consultation is forecast to be conducted prior to any mining activity. Based on past section 7 consultations for projects with similar potential effects, the Service has outlined possible conservation efforts that would likely be included in a consultation for mining activity at the site. These conservation efforts and estimates of associated costs are presented in Exhibit 4-3. Based on these costs and the acreage of TXI's mining claims as estimated using GIS, post-designation impacts are developed and presented below in Exhibit 4-4.

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<sup>93</sup> U.S. Fish and Wildlife Service. "Conference Opinion on Jimenez Pit Sand and Gravel Mine Project," Consultation # 1-6-98-F07, with the Bureau of Land Management. February 20, 1998; and U.S. Fish and Wildlife Service. "Biological Opinion on Sand and Gravel Mining Along Permiteter Slopes of the Coyote and Jacumba Mountains," Formal Consultation # FWS-ERIV-3371.1, with the Bureau of Land Management. July 28, 2003.

## EXHIBIT 4-3 POSSIBLE CONSERVATION MEASURES FOR MINING ACTIVITY IN UNIT3

POSSIBLE CONSERVATION EFFORTS <sup>(1)</sup>	ECONOMIC IMPACT (UNDISCOUNTED)
Re-contouring and re-vegetation of mine lands after completion of ground disturbing activities.	\$2.03 million (\$675 /acre) <sup>(2)</sup>
Acquisition of one acre of undisturbed bighorn sheep habitat for every acre to be mined in the future. If appropriate land is unavailable, provision of funding for future acquisition and bighorn sheep management.	\$22.5 million (\$7,500/acre) <sup>(3)</sup>
Preparation and implementation of an employee education program covering bighorn sheep ecology and management, and applicable sections of the ESA.	\$4,000 <sup>(4)</sup>
Implementation of a monitoring program to evaluate reclamation plan.	\$46,500 <sup>(4)</sup>
<ul style="list-style-type: none"> <li>Monitoring and removal of nonnative plants along travel routes.</li> <li>Development of a reclamation and re-vegetation plan, including pre-mining removal and storage of plants by a qualified biologist for later re-planting.</li> <li>Mining personnel would not approach Peninsular bighorn sheep.</li> </ul>	It is uncertain what the extent of non-native plant presence is, and therefore what the extent and cost impacts of removal would be. Plan development costs are not readily available.
Prevention of bighorn sheep access to human-made sources of water that could pose injury or mortality risk to sheep.	Not quantified - it is not known what water sources might be present or developed in the future at the site. Fencing costs would likely be incurred to exclude bighorn sheep from any man-made water sources that are present.
Closure of mine access roads during non-operating hours.	Minimal potential for impact.
Deconstruction and reclamation of mine access roads upon completion of mining activities.	Not quantified - the extent and topography of future access roads requiring deconstruction and reclamation are unknown.
Confinement of mining operations to permitted area only.	Not quantified - the boundaries of the future permitted area are unknown.
Placement of mine waste material between active mine sites and adjacent up-slope habitat to serve as sound and visual barriers.	Not quantified - the cost of placing unknown quantities of mine waste in unknown locations can not be estimated.
Timing restrictions on construction of surface facilities and use of above-ground explosives (avoidance of lambing season, February to April).	Not quantified - TXI notes that blasting is required, but the potential costs of timing limitations are unknown.
Vehicle speed limits of 30mph.	Impacts dependent on the actual mine site development (currently not finalized) and road plan. Impacts may be minimal.
Prohibition of domestic dogs on-site.	Minimal impact expected.
Location of processing plants to minimize noise and disturbance to bighorn sheep.	It is uncertain whether this guidance would change site development plans to a degree that results in impacts.

- (1) Written communication from U.S. Fish and Wildlife Service, Carlsbad Office. "Possible Conservation Measures of Limestone mining of TXI Creole Corporation Claims in Peninsular bighorn sheep Critical Habitat." Received April 14, 2008. The Service included the following proviso: "These conservation measures are a combination of those protection measures proposed by an Action Agency and/or specific details provided in Terms and Conditions of an Incidental Take Statement (Biological Opinion Numbers 1-6-98-F07 and FWS-ERIV-3371.1). These potential conservation measures are an example of those measures that would be considered for future mining consultations. However, please note that additional or modified conservation measures may be warranted on a site-specific basis and would not be determined until such point in time as a consultation was initiated."
- (2) California Natural Resource Conservation Service (NRCS) State Approved Cost Share List for Fiscal Year 2007: \$500 for conservation cover, bed prep, seed, seeding of natives plus \$175 for land smoothing applied to GIS estimation of potential ground area to be re-contoured and re-vegetated.
- (3) The one-to-one compensation ratio was applied in Section 3.3 to estimate the impacts of conserving the bighorn sheep when habitat is displaced. This ratio is based on a review of the consultation history and discussion with the Service.
- (4) Estimates are based on interviews with Jones & Stokes Associates, Inc., Irvine CA, May 2001 and Dudek and Associates, Encinitas, CA, April 2001, and with senior biologists at Tetra Tech, Inc., San Bernardino CA; SJM Biological Consultants, San Diego CA; P & D Environmental, Orange CA; Dames and Moore, Inc., Rancho Cucamonga CA; a consulting botanist located in Santa Ana CA; and Natures Image, Inc., CA, for similar conservation measures for another endangered species in southern California.

#### EXHIBIT 4-4 POST-DESIGNATION BASELINE MINING IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
3. Carrizo Canyon	\$19,200,000	\$13,200,000	\$1,290,000	\$1,240,000
<b>TOTAL</b>	<b>\$19,200,000</b>	<b>\$13,200,000</b>	<b>\$1,290,000</b>	<b>\$1,240,000</b>

#### 4.4 POST-DESIGNATION INCREMENTAL IMPACTS

145. The forecast section 7 consultation for TXI Creole Corporation's mining activities will consider the potential for adverse modification to critical habitat for the bighorn sheep. The portion of the administrative costs of consultation for this effort, \$4,880 is the only incremental impact expected, since the potential conservation measures listed in Exhibit 4-3 would be required regardless of the designation of critical habitat (the conservation measures outlined by the Service and presented above are based on previous consultations and do not include measures specific to critical habitat.). Absent information on a specific time when a consultation would be initiated, it is assumed to occur in 2008.

**EXHIBIT 4-5 POST-DESIGNATION INCREMENTAL MINING IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
3. Carrizo Canyon	\$4,880	\$4,880	\$328	\$461
<b>TOTAL</b>	<b>\$4,880</b>	<b>\$4,880</b>	<b>\$328</b>	<b>\$461</b>

**4.5 SOURCES OF UNCERTAINTY**

The conservation efforts provided in Exhibit 4-3 are forecasts of the actual impacts from conservation efforts that may be necessary for mining operations to occur that minimize the potential to negatively affect the bighorn sheep. The timing of consultations and application of conservation efforts is estimated as well. To the extent that different conservation efforts are undertaken, actual conservation efforts have different impacts, or that the timing is different, the impacts in this chapter may be inaccurate.

## CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO RECREATION-RELATED ACTIVITIES

146. This chapter describes how conservation efforts to protect the bighorn sheep and its habitat may affect recreational activities that occur within the study area. The proposed rule indicates that recreational activities may pose a threat to the bighorn sheep in all four of the units proposed for designation.<sup>94</sup> This chapter does not focus on recreation-related expenditures (e.g., trail maintenance and monitoring under general land management plans; these impacts are included in Chapter 2); rather it quantifies the impact of conservation efforts on recreational activities. Specifically, these impacts are the recreation opportunities foregone, and effects on businesses due to trail closures.
147. This chapter first discusses the issues concerning recreation in bighorn sheep habitat. Next, the chapter quantifies the impacts from 1998-2007. Forecast estimates for the post-designation baseline and incremental analysis follow.
148. Impacts from conservation measures include the administrative and research costs for two recreation consultations and the opportunity costs arising from recreational area use restrictions. The impacts from these restrictions are estimated as opportunity costs. Benefits transfer is utilized to estimate the impacts of trail closures within critical habitat. Tourism business owners near Carrizo Canyon (Unit 3) were surveyed to provide their estimates of economic impacts they have incurred.

### 5.1 RECREATIONAL ACTIVITIES IN BIGHORN SHEEP HABITAT

149. Recreational activities in the study area include hiking, camping, mountain biking, and off-road vehicle use. Some trails are annually closed during periods when humans are likely to interact with the bighorn sheep and may cause disturbance or take. This section addresses the impact of seasonal closures on visitors who are unable to enjoy the recreational opportunities they want to.
150. The impact of recreation opportunities foregone results in a loss of value. This loss is the lost value of recreation that the entrants to a closed recreation area would otherwise have enjoyed. This lost value is the portion of consumer surplus that recreation consumers are no longer able to enjoy in these areas. Consumer surplus measures how much a consumer enjoys doing something, net of the costs of doing it. For example, a hiker who owns her own equipment and does not have far to travel to go on a hike, has a consumer

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<sup>94</sup> Resort or golf course development impacts are addressed in Chapter 3.

surplus value equal to her enjoyment of the hike, less the value of the effort of completing the hike.

151. Consumer surplus is not directly observed and is not directly measurable. Instead, consumer surplus must be measured with non-market valuation techniques, such as stated and revealed preference methodologies. There is a rich empirical literature in environmental economics that has used these preference-revealing techniques to estimate consumer surplus values for a variety of recreation activities. This analysis uses the revealed preference research in the environmental economics literature to obtain recreation values that can be applied to the recreation values foregone in bighorn sheep inhabited locations where recreation closures are in effect. The methodology for obtaining and using estimates from previously published studies is called benefits transfer.
152. The loss of consumer surplus due to recreation area closures in the study area may not result in a welfare loss. That is, the value lost from not being able to pursue recreation opportunities in specific locations may be made up elsewhere, since substitute locations do exist. However, the closed areas tend to be highly desired, so the substitute locations represent second best options. Furthermore, would-be recreation area users may not be able to use other areas if substitute areas are subject to congestion caused by the closures.
153. The next section discusses the methodologies for benefits transfer recommended by the U.S. Environmental Protection Agency (EPA) and the U.S. Office of Management and Budget (OMB). The use of these methodologies to select benefits transfer values for hiking and off road vehicle recreation area closures is then described. The following section uses the benefit transfer estimates to estimate the opportunity costs from hiking trail closures.<sup>95</sup>

#### 5.1.1 EPA BENEFITS TRANSFER METHODOLOGY

154. This section follows the EPA benefit-transfer guidelines, and references the OMB guidelines where there are differences.<sup>96</sup> The EPA guidelines state that “... *When conducting a benefit transfer, one should make certain that each of the following steps are carried out carefully.*”<sup>97</sup> (p. 86, 2nd column). The steps are highlighted below, and each is followed by a discussion of how the specific step was addressed in the benefit transfer for hiking in the study area.

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<sup>95</sup> Insufficient publicly available data are available to estimate impacts upon other activities besides hiking. Hiking is likely to represent the majority of potential uses in many of these areas.

<sup>96</sup> U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, September, 2000; U.S. Office of Management and Budget, Circular A-4, Guidelines to Federal Agencies on the Development of Regulatory Analysis, September 17, 2003.

<sup>97</sup> U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, September, 2000, p. 86, 2<sup>nd</sup> column.



**(1) Describe the Policy Case**

155. The “policy case” are opportunities for hiking in the study area that are not realized due to area closure designed to protect the bighorn sheep and its habitat. Since trails in these areas are very popular, and trailheads are easily accessible to populated areas, the closure of these areas will cause a loss of value for the would-be hikers.
156. Valuation of the lost hiking opportunities requires that the change in use conditions be well defined and the number of would-be hikers is known. The change in use conditions is straightforward: the closure results in no hikes being possible during the seasonal closure periods. Visitation numbers are available for some of the trails in the areas. The trails are in close enough proximity to each other to allow imputation of similar visitation numbers for the trails where visitation numbers are unknown.

**(2) Identify Existing, Relevant Studies**

157. The non-market valuation literature contains several empirical examples of the value of hiking by hikers in a wide variety of situations across the United States. A substantial number of these studies are extensively reviewed in two recent reports for the US Forest Service.<sup>98</sup> The 2000 report identified 17 hiking studies that provided 29 hiking valuations. The 2006 report identified 21 studies with 68 hiking valuations.

**(3) Review Available Studies for Quality and Applicability**

158. The first part of the applicability review involves looking for studies where hiking is likely to be comparable to the hiking opportunities foregone in the Santa Rosa Mountains. Baker (1996) uses a travel cost methodology for hiking in California in different settings and scenarios.<sup>99</sup> This report provides seven hiking activity valuations that range (in 2005 constant dollars) from \$12 to \$35, with a median value of \$30. These values are comparable to hiking valuation studies from other states and regions (for example, Englin and Shonkwiler, 1995, report values of \$26 and \$39 for hiking in the Cascade Mountains in Washington).<sup>100</sup> The Baker study also uses travel cost methodology, which is a revealed preference non-market valuation technique that is not subject to as many methodological criticisms as revealed preference (survey) valuation methodologies are.

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<sup>98</sup> Rosenberger and Loomis, “Benefit Transfer of Outdoor Recreation Use Values,” US Department of Agriculture Forest Service, Pacific Northwest Research Center, General Technical Report RMRS-GTR-72, 2001 and Loomis, John, “Updated Outdoor Recreation Use Values on National Forests and Other Public Lands,” US Department of Agriculture Forest Service, Pacific Northwest Research Center, General Technical Report PNW-GTR-658, October 2005.

<sup>99</sup> Baker, C.J., “A Nested Poisson Approach to Ecosystem Valuation: An Application to Backcountry Hiking in California,” (Reno, Nevada: University of Nevada, Reno, 1996).

<sup>100</sup> Englin, J., and J.S. Shonkwiler, “Estimating Social Welfare Using Count Data Models: An Application to Long-Run Recreation Demand Under Conditions of Endogenous Stratification and Truncation,” *Review of Economics and Statistics*, 1995, pp. 104-112. The values reported are in 2005 constant dollars.

- (4) The basic commodities must be essentially equivalent,
- (5) The baseline and extent of change should be similar, and
- (6) The affected populations should be similar.

159. The Baker (1996) study provides estimates for hiking activity days, which is the metric necessary to calculate the values foregone due to closures. The study provides total values for recreation days spent hiking. The trail closures will cause recreation days hiking to be lost. Selection of the Baker (1996) study results in selection of a similar population. The study was of hikers in California. The population affected by the closures are hikers in California.

#### (7) Transfer the benefit estimates

160. The next step in the benefits transfer is to estimate the recreation loss values (i.e., to transfer the benefits). This analysis uses the median value estimate of \$30. The median is chosen because it is the central estimate of the seven estimates presented by Baker (1996). As mentioned above, the \$30 median value is similar to other hiking valuation estimates in the literature. The estimated recreation loss values are presented in Exhibits 5-1, 5-2, and 5-3.

#### (8) Address Uncertainty

161. There are several assumptions that must be made in order to perform the benefits transfer for hiking values foregone due to trail closures. First, the values from the research presented in the report from 1996, are assumed to not have changed in any real way since then. If the recreation value of hiking opportunities has changed, then the values reported may not accurately capture the real values foregone. Benefits transfer also assumes that the population that was studied in the past research is similar to the population that will be affected by the recreation area closure. If this is not true, then the benefits transfer may result in an improper estimate. Uncertainties in the analysis are addressed further at the conclusion of this chapter.

#### 5.1.2 OMB BENEFITS TRANSFER METHODOLOGY

162. Benefits transfer guidance from OMB is similar in most respects. A clear definition of the policy question is seen as the key component. OMB's guidelines for selection of the proper study for the benefits transfer are similar, though OMB provides more detail regarding the specifics of the empirical methods used. The methodology in the study used for this benefits transfer meets these criteria. OMB concludes their guidance with warnings of situations where it is clearly improper to use benefits transfer: where the activity is unique, where *ex ante* values will be compared to *ex post* values, and where the study is based on small, marginal changes. Baker (1996) does not fall into any of these categories; the results are judged valid for benefits transfer.

#### 5.1.3 RESTRICTIONS TO HIKING

163. The Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP) stipulates that on private, county, or state lands, all recreation trails will be kept open or subject to a self-permit system and analyzed during a research period to evaluate the impacts of

human recreation on bighorn sheep. In the tenth year, the study results and management recommendations will be integrated into a new management plan.

164. Several trails are to be kept closed during the “hot season,” when high temperatures force the bighorn sheep to seek water in specific locations. Trails in these locations are to be closed to hikers between June 15 and September 30 annually. Coyote Canyon, in Anza-Borrego Desert State Park is closed from June 1 to September 30. These trails are listed in Exhibit 5-1. One of these trails, Carrizo Canyon, is closed in both the hot season (June 15 to September 30) and the lambing season (January 1 to June 30).

**EXHIBIT 5-1 ESTIMATED TRAIL CLOSURE IMPACTS**

UNIT	TRAIL CLOSED	YEAR CLOSED	CLOSURE DATES	TOTAL VISITATION ESTIMATE	LOST VALUE PER YEAR
2A. North Santa Rosa Mountains	The Art Smith Trail west of its intersection with the Hopalong Cassidy Trail	2005	June 15 to September 30	12,611	\$37,818
	Bear Creek Canyon Trail south of its intersection with the Bear Creek Oasis Trail	2005	June 15 to September 30	12,612	\$37,818
	Bear Creek Oasis Trail	2005	June 15 to September 30	12,612	\$37,818
	Carrizo Canyon	2005	January 1 to September 30	32,422	\$97,245
2B. South Santa Rosa Mountains	Coyote Canyon	1975	June 1 to September 30	2,003	\$6,000
Notes: (1) From BLM, Palm Springs South Coast Field Office, "Final Environmental Assessment CA-660-06-04," November, 2005. (2) Extrapolated visitation values from Art Smith Trail visitation estimates. (3) Estimate from Written communication from Mark Jorgensen, Superintendent, Anza-Borrego Desert State Park, December 17, 2007.					

165. The trailhead for Carrizo Canyon is in close proximity to the Art Smith trailhead, and both trails are of similar length. In the absence of data concerning the potential visitation numbers to Carrizo Canyon, the visitation amounts from a similar trail (Art Smith) are used to extrapolate visitation numbers for the Carrizo Canyon trail. The Bear Canyon trails are also in proximity. The same extrapolation procedure is used to calculate their visitation numbers as well.
166. The visitation estimates correspond to the closure periods (except for Carrizo Canyon, where the numbers are extrapolated based on the closure length). Each visitation that is precluded due to the closure is assumed to be a hiking recreation day lost. Exhibit 5-1 also includes the estimated yearly value lost, based on the \$30 per hiking recreation day from the benefits transfer described in the previous section. The estimated value is the estimated visitation multiplied by \$30 (the value of a hiking recreation day).

167. Additional conservation impacts for hiking include construction of a 1,300 foot fence to preclude human entry into Carrizo Canyon from January 1 to September 30.<sup>101</sup> A fence construction cost of three dollars per foot yields a one-time cost of \$3,900 in 2006.<sup>102</sup>
168. Several trails are slated for decommissioning and closure under the CV MSHCP. Closure of these trails, however, is to take place with the simultaneous construction of new trails in the same area. For example, the upper portion of the Mirage “Bump and Grind” Trail is to be closed upon construction of the Hopalong Cassidy perimeter trail.<sup>103</sup> Since one trail will be closed as another, substitute trail opens, there are no use-value losses estimated for the portion of trail that will be closed. Would-be trail users in the closed area will use the newly constructed portion of the trail instead. This is a different situation than the seasonal closures discussed above; the seasonal closures are not instituted with a simultaneous opening of alternative trails.

#### 5.1.4 RESTRICTIONS TO OFF-ROAD VEHICLE USE

169. Off-road vehicle use is prevalent and increasing in the eastern portions of Carrizo Canyon (Unit 3).<sup>104</sup> Seasonal restrictions have closed places with bighorn sheep habitat during lambing, from January 1 through June 30, yearly. These closures were adopted as part of the Western Colorado Desert Routes of Travel Designation in 2003 in response to recommendations in the Service’s Recovery Plan for the Peninsular Bighorn Sheep.<sup>105</sup>
170. Two off-highway vehicle (OHV) rental and equipment companies report impacts of reduced business as a result of the seasonal area closures. One reported losses of \$60,000 per year and the other reported losses with an average of \$55,000 per month during the recreation season. These impacts, beginning in 2003, are included as recreation business impacts.<sup>106</sup>
171. There is also the potential that the bighorn sheep related area closures may cause recreation values losses for off-road vehicle users similar to those resulting from hiking closures. In the case of off-road vehicle use, however, there is only one relevant study that addresses the valuation of lost off-road vehicle recreation value. The single valuation study does not meet the sample or methodological requirements of the EPA and OMB guidance on benefits transfer. Furthermore, no reliable estimates of off-road vehicle use

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<sup>101</sup> U.S. Department of Interior, Bureau of Land Management, Palm Springs South Coast Field Office, “Final Environmental Assessment CA-660-06-04,” November, 2005.

<sup>102</sup> Fence building cost from Natural Resources Conservation Service (NRCS), California State Approved Practice Cost Share List – Fiscal Year 2007.

<sup>103</sup> See US Bureau of Land Management, Palm Springs South Coast Field Office, “Final Environmental Assessment CA-660-06-04,” November, 2005, pp. 7-63 – 7-64.

<sup>104</sup> Personal communication with Manager, Academy Rentals Company, Ocotillo, California, December 17, 2007. Personal communication with Dallas Meeks, Outdoor Recreation Planner, US Bureau of Land Management, El Centro Office, December 18, 2007.

<sup>105</sup> U.S. Department of Interior, Bureau of Land Management, “Decision Record for Western Colorado Desert Routes of Travel Designation, An Amendment to the California Desert Conservation Area Plan of 1980,” 2003, p. 6.

<sup>106</sup> Other local businesses have been contacted concerning closure impacts, but have not provided impact estimates.

at the Unit 3 locations are publicly available. As a result, no benefits are transferred for valuing off road vehicle use.

## 5.2 PRE-DESIGNATION BASELINE IMPACTS

172. There were two pre-designation section 7 consultations concerning recreational activities in the study area. Hiking restrictions in the North and South Santa Rosa Mountains (Units 2A and 2B) and the area closures in Carrizo Canyon (Unit 3) were instituted during the pre-designation period in response to the species Recovery Plan. The added costs from the consultations and the opportunity costs caused by the recreational restrictions constitute the pre-designation baseline impacts.
173. In 1999 the U.S. Bureau of Land Management (BLM) consulted with the Service concerning a special recreation permit for Desert Adventures Jeep-Eco Tours to use Dunn Road which traverses private and BLM land for sightseeing tours in the North Santa Rosa Mountains unit (Unit 2A).<sup>107</sup> The consultation stipulated several conservation measures for use of the road. The cost of the consultation is included in the analysis. Desert Adventures Jeep Eco-Tours has not provided information about economic impacts due to the consultation requirements.
174. A formal consultation addressed building a dog-walking trail in parkland owned by the BLM and the City of Palm Desert (Cahuilla Hills and Homme-Adams Park) as an offset to eliminating all dog walking in other areas that bighorn sheep frequent. The new parkland was created on existing BLM and city owned land. The consultation called for the creation of a one-mile connector trail in BLM land with appropriate signage used to inform travelers about bighorn sheep over the entire trail system. The plan also called for management of the dog walking area to monitor the trails and to minimize impacts on the bighorn sheep. The trail construction effort impacts can be estimated by referring to the “Natural Resources Conservation Service (NRCS) California State Approved Practice Cost Share List – 2007” for trail/access road construction costs (six dollars per foot). The consultation and trail construction costs are assumed to occur in 2003. While other management and prevention measures are discussed, none are described sufficiently to calculate impacts with publicly available data.
175. The pre-designation impacts of hiking trail closures in the North Santa Rosa Mountains (Unit 2A) begin in 2005 as part of the development of the Coachella Valley MSHCP. The pre-designation impact of hiking trail closures in the South Santa Rosa Mountains (Unit 2B) began in 1975 in response to threats to the bighorn sheep.<sup>108</sup>
176. The pre-designation impacts of OHV limitations in Carrizo Canyon (Unit 3) include the estimated lost revenues to OHV rental and equipment companies. These estimates are based on projections of revenues that the companies would make in the absence of the

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<sup>107</sup> U.S. Fish and Wildlife Service. “Biological Opinion on Desert Adventures Jeep Eco-Tours,” Formal Consultation # 1-6-98-F-14, with the Bureau of Land Management. July 27, 1999.

<sup>108</sup> Written communication from Mark Jorgensen, Superintendent, Anza-Borrego Desert State Park, December 17, 2007.

bighorn sheep lambing season area closures. Desert Adventures, LLC, estimates a yearly loss of \$60,000 and Academy Rentals estimates a loss of \$40,000 to \$70,000 per month.<sup>109</sup> Mojave Desert Racing Productions, another affected OHV company in the area was unable to estimate impacts from the closure. Seasonal closures began in 2003 in response to recommendations in the bighorn sheep Recovery Plan and are expected to remain in effect for the reasonably foreseeable future.

177. Exhibit 5-2 presents the sums of the pre-designation impacts in the study area. The majority of the impacts are due to lost business revenue arising from the seasonal closure of OHV areas in Carrizo Canyon (Unit 3). The next largest share of impacts is due to the seasonal hiking restrictions in place in the North Santa Rosa Mountains (Unit 2A).

#### EXHIBIT 5-2 PRE-DESIGNATION BASELINE RECREATION IMPACTS

UNIT	PRESENT VALUE 3% DISCOUNT RATE	PRESENT VALUE 7% DISCOUNT RATE
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$70,800	\$88,700
3. Carrizo Canyon	\$2,070,000	\$2,240,000
<b>TOTAL</b>	<b>\$2,140,000</b>	<b>\$2,330,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$1,180,000	\$1,320,000
<b>TOTAL</b>	<b>\$1,180,000</b>	<b>\$1,320,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan		

#### 5.3 POST-DESIGNATION BASELINE IMPACTS

178. The baseline impacts are due to the continuation of recreation area closures that were established in the pre-designation period. Since development of the MSHCP had begun in the mid 1990s and because the MSHCP was initiated in response to the species recovery plan, the 2005 trail closures in Unit 2A (North Santa Rosa Mountains) are considered to be part of the post-designation baseline. The recreation area closure in Unit 2B (South Santa Rosa Mountains) was initiated in 1975, and is thus also part of the

<sup>109</sup> Personal communication with Manager, Academy Rentals Company, Ocotillo, California, December 17, 2007. Personal communication with Manager, Desert Adventures, LLC Company, Ocotillo, California, December 17, 2008. Personal communication with Manager, Mojave Desert Racing Productions December 18, 2007.

baseline conservation impacts. The OHV recreation area closures in Unit 3 (Carrizo Canyon) were implemented in Unit 3 in response to the species recovery plan; these impacts are also considered a continuation of baseline impacts. There are no forecast section 7 consultations; nor are there forecasts for new project modifications in the reasonably foreseeable future.

179. The summarized impacts for recreation impacts are presented in Exhibit 5-3. These impacts are primarily due to the effects of the OHV area seasonal closure upon businesses in Carrizo Canyon (Unit 3). The impacts in Units 2A and 2B (North and South Santa Rosa Mountains) are the values foregone from lost hiking recreation opportunities due to area closures. Both the business impacts and hiking opportunities foregone are assumed to continue at a constant rate into the future.

**EXHIBIT 5-3 POST-DESIGNATION BASELINE RECREATION IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$91,900	\$68,000	\$6,180	\$6,420
3. Carrizo Canyon	\$5,980,000	\$4,420,000	\$402,000	\$417,000
<b>TOTAL</b>	<b>\$6,070,000</b>	<b>\$4,490,000</b>	<b>\$408,000</b>	<b>\$424,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$3,230,000	\$2,390,000	\$217,000	\$226,000
<b>TOTAL</b>	<b>\$3,230,000</b>	<b>\$2,390,000</b>	<b>\$217,000</b>	<b>\$226,000</b>
Notes: Tables may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				



#### 5.4 INCREMENTAL IMPACTS

180. There are no incremental impacts forecast for recreation activities in the study area. No section 7 consultations are forecast. The recreation restrictions that are already in place are the only restrictions that can be predicted. The species management plans that will research impacts of recreation in various areas may generate impacts, but these are not foreseeable at this time.

#### 5.5 SOURCES OF UNCERTAINTY

181. The analysis of recreation impacts relies on several assumptions that introduce uncertainty into the estimates. Sources of uncertainty that may affect the valuation estimates for recreation activities include those addressed in the section on benefits transfer, as well as other concerns, such as data availability and reliability, the measurement of welfare versus distributional effects, and the assumed continuation of impacts into the future.
182. The benefits transfer sections (5.1.1 and 5.1.2) review the uncertainties associated with potential violations of the assumptions for the benefits transfer. Violations of these assumptions may cause the estimated impacts to be higher or lower than their actual values, but this divergence is not possible to forecast with existing information. Data availability and reliability issues may also have important influences. The visitation numbers for several of the trails are extrapolated from the known visitation numbers on one trail in the area. To the extent that visitation numbers on trails where the numbers of visits have not been counted are actually different, the opportunity cost estimates will be incorrect. Likewise, the reported lost business impacts may be greater (not all surveyed businesses responded).
183. The remaining two areas of uncertainty concern the projection of impacts into the future. No data are available to forecast how impacts are likely to change in the future, and so impacts are assumed to continue at current levels for the next 20 years. In reality, there is likely to be some adaptation to the closures that may reduce the impacts. However, continued population growth in the area may increase demand for the closed areas which would increase the impacts. Would-be recreation area users who are impacted by the closures are likely to seek out and find alternative recreation opportunities. This action will reduce the opportunity costs foregone; there will be less of a net welfare loss. In this way, the opportunity costs of the closures measure a distributional effect where the impacts are location-specific, but not region-specific. That is, the impacts for would-be recreation users are likely to be ameliorated by their use of substitute locations. As a result, the recreation activity impacts reported in this chapter are likely to be an upper bound on impacts.

## CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO TRANSPORTATION-RELATED ACTIVITIES

184. This chapter describes how conservation efforts to protect the bighorn sheep and its habitat may affect transportation activities in the study area. Transportation activities may pose a threat to the bighorn sheep in all of the proposed critical habitat units.<sup>110</sup> This chapter discusses the issues concerning transportation impacts in bighorn sheep habitat, including the construction of roadways and other related structures as well as effects due to the presence of the structure after construction is complete.
185. Transportation poses the risks of accidental take through vehicle collisions with bighorn sheep as well as sheep disturbance due to the presence of moving vehicles within their habitat. Disturbances such as fast-moving vehicles are linked with higher stress levels in bighorn sheep, and can be attributed to decreased lambing and foraging behavior in adult sheep and decreased levels of lambing in lambs. Transportation activities pose risks of habitat fragmentation because roads or throughways can produce a physical barrier between areas that would otherwise be a continuous habitat for bighorn sheep.
186. The construction and subsequent usage of roadways and other transportation structures is directly related to the development and population density in areas adjacent to the roadway.

### 6.1 PRE-DESIGNATION BASELINE IMPACTS

187. The California Department of Transportation (Caltrans) has been engaged in projects to maintain roads in the Santa Rosa Mountains area, specifically along State Route 74 (SR-74). SR-74 has had increasing traffic volumes since 2000, due to development in Palm Desert and other communities along the eastern side of the Santa Rosa Mountains. There are seven miles of SR-74 within the proposed critical habitat.
188. In 2004, the Fish and Wildlife Service issued a letter of concern to Caltrans documenting instances of bighorn sheep in the vicinity of the highway and oncoming vehicles.<sup>111</sup> This occurrence was particularly frequent at the 2,800 foot elevation contour. The Service recommended construction of a wildlife overpass in order to avoid the risk of collision.<sup>112</sup>

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<sup>110</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Habitat for the Peninsular Bighorn Sheep and Proposed Taxonomic Revision; Proposed Rule, October 10, 2007.

<sup>111</sup> This letter of concern is assessed as having impacts equivalent to a Technical Assistance consultation (\$1,500).

<sup>112</sup> U.S. Fish and Wildlife Service, Letter to Mr. Steve Keel, Caltrans, District 8, October 4, 2004.

189. Reported pre-designation activities occurred along SR-74 and included guardrail replacement, bighorn signage installation, and vista point construction projects. All of these projects occurred within units considered for exclusion, in the Northern Santa Rosa Mountains (Unit 2A).
190. In July 2005, Caltrans completed a project that replaced guardrails in Riverside County on SR-74. Project modifications were limited to restricting the project timeframe to outside the bighorn sheep lambing season, January 1 to June 30 and putting up warning signs along SR-74.<sup>113</sup> Caltrans worked with the Bighorn Institute to develop the content of the signs. The project cost totaled \$5,000.<sup>114</sup> This construction site was a previously disturbed area; additional vegetation was planted to reduce the potential for erosion and thereby protect bighorn sheep habitat at an estimated cost of \$550.<sup>115</sup> Caltrans undertook a section 7 consultation with the Service on this project in 2002.<sup>116</sup>
191. Caltrans completed a vista point construction project along State Route 74 during 2007. This provides an area where motorists can pull off of the road to enjoy the view of the Coachella Valley from the roadway. This project was located in Riverside County on land that is owned and managed by the Bureau of Land Management. Caltrans undertook an informal section 7 consultation with the Service on this project in 2002.<sup>117</sup> The project also required 40 additional hours of administrative time to address concerns related to the bighorn sheep, with an estimated cost of \$10,300.
192. Exhibit 6-1 provides the estimated pre-designation impacts for the study area. There are no pre-designation impacts for units proposed for critical habitat or proposed for exclusion. The present value of the pre-designation impacts for units considered for exclusion is \$44,200, using a seven percent discount rate.

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<sup>113</sup> Written communication with Scott Quinnell, Associate Biologist, Caltrans, District 8, December 4, 2007.

<sup>114</sup> Ibid.

<sup>115</sup> Cost estimates from Natural Resources Conservation Service (NRCS) California State Approved Practice Cost Share List 2007

<sup>116</sup> Personal communication with Scott Quinnell, Associate Biologist, Caltrans, District 8, December 3, 2007.

<sup>117</sup> Ibid.

## EXHIBIT 6-1 PRE-DESIGNATION BASELINE TRANSPORTATION IMPACTS

UNIT	PRESENT VALUE 3% DISCOUNT RATE	PRESENT VALUE 7% DISCOUNT RATE
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0
3. Carrirzo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$39,500	\$44,200
<b>TOTAL</b>	<b>\$39,500</b>	<b>\$44,200</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan		

## 6.2 POST-DESIGNATION BASELINE IMPACTS

193. Caltrans is anticipating increasing usage of SR-74 and anticipates the widening of this roadway within the 2008-2027 timeframe. When SR-74 is widened, an overpass would be considered as a measure to address potential impacts to the bighorn sheep. The overpass would help bighorn sheep avoid potential collisions with motorists and provide the species with a safe route to cross the highway. The overpass would also serve to minimize the impacts of habitat fragmentation due to the presence of roadways within the critical habitat.<sup>118</sup>
194. Caltrans is currently working with the Bighorn Institute regarding the location of the overpass and estimates that the project costs would total between \$5 million and \$10 million.<sup>119</sup> For this analysis, an average cost of \$7.5 million was used. These costs are attributable to the baseline scenario due to the fact that this overpass would be constructed regardless of the critical habitat designation. This overpass will be built in critical habitat Unit 2A.
195. The overpass construction project does not pose any specific threats to the bighorn sheep at this time. One section 7 consultation is expected to occur in 2015. The outcome of

<sup>118</sup> Ibid.<sup>119</sup> Ibid.

this consultation is uncertain. Therefore no project modification impacts are estimated for this analysis.<sup>120</sup>

196. Another Caltrans project involves the seismic retrofitting of two bridges on I-8, a major interstate that is located in San Diego and Imperial counties. This project is located within Unit 3. The Caltrans office, District 11, covering San Diego and Imperial counties plans to consult formally with the Fish and Wildlife Service in 2008.<sup>121</sup> The seismic retrofit project is a routine bridge maintenance procedure that would occur regardless of the critical habitat designation and is attributed solely to the post-designation baseline scenario. The outcome of this consultation is uncertain, and therefore no project modification impacts are estimated for this analysis.<sup>122</sup>
197. Exhibit 6-2 provides the estimated post-designation baseline impacts for the study area. The post-designation impacts for units proposed for critical habitat are \$7,130 (discounted at either three or seven percent). These costs are incurred in 2008, or the year of the critical habitat designation, and thus the same present value is reported at the three percent discount rate and the seven percent discount rate. However, applying a three percent discount rate, the forecast annualized value is \$479 and at the seven percent discount rate, the forecast annualized value is \$673.
198. There are no post-designation baseline impacts forecast for the Tribal areas. The post-designation baseline impacts forecast for the critical habitat units considered for exclusion are \$4.7 million (\$442,000 annualized), assuming a seven percent discount rate.

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<sup>120</sup> Written communication with Scott Quinnell, Associate Biologist, Caltrans, District 8 December 4, 2007.

<sup>121</sup> Personal communication with Robert James, Senior Environmental Planner, Caltrans, District 11, November 26, 2007.

<sup>122</sup> Ibid.

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## EXHIBIT 6-2 POST-DESIGNATION BASELINE TRANSPORTATION IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$7,130	\$7,130	\$479	\$673
<b>TOTAL</b>	<b>\$7,130</b>	<b>\$7,130</b>	<b>\$479</b>	<b>\$673</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$6,110,000	\$4,680,000	\$411,000	\$442,000
<b>TOTAL</b>	<b>\$6,110,000</b>	<b>\$4,680,000</b>	<b>\$411,000</b>	<b>\$442,000</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan.				

**6.3 INCREMENTAL IMPACTS**

199. The incremental costs related to transportation activities can be attributed to the incremental portions of section 7 consultations with the Fish and Wildlife Service.
200. Exhibit 6-3 provides incremental impacts on transportation due to the critical habitat designation. The incremental impacts for proposed critical habitat units are \$2,380 (discounted at either three or seven percent).<sup>123</sup>
201. There are no incremental impacts estimated for the Tribal areas. The post-designation baseline impacts forecast for the critical habitat units considered for exclusion are \$3,040 (\$287 annualized), assuming a seven percent discount rate.

<sup>123</sup> These costs are expected to be incurred in 2008, the year of the critical habitat designation, and thus the same present value is reported at the three percent discount rate and the seven percent discount rate.

## EXHIBIT 6-3 INCREMENTAL TRANSPORTATION IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$2,380	\$2,380	\$160	\$225
<b>TOTAL</b>	<b>\$2,380</b>	<b>\$2,380</b>	<b>\$160</b>	<b>\$225</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$3,970	\$3,040	\$267	\$287
<b>TOTAL</b>	<b>\$3,970</b>	<b>\$3,040</b>	<b>\$267</b>	<b>\$287</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				



## CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS RELATED TO UTILITY CONSTRUCTION

202. This chapter describes how conservation efforts to protect the bighorn sheep and its habitat may affect utility construction and maintenance activities in the study area. The proposed rule indicates that utilities activities may pose a threat to the bighorn sheep in the South Santa Rosa Mountains (Unit 2B).<sup>124</sup>
203. Utilities construction may pose risks to the bighorn sheep if construction activities occur when bighorn sheep are present. Presence of cranes and other construction equipment may temporarily alter bighorn sheep behavior, as the animals attempt to avoid contact with the disturbance. This response is heightened when lambs are present. Furthermore, the use of helicopters during utility construction causes noise disturbances that can lead to elevated stress levels in bighorn sheep.
204. The first section of this chapter reviews the bighorn sheep conservation efforts that were employed during a utility cable line installation during the pre-designation period. The second section quantifies expected baseline impacts from the proposed Sunrise Powerlink electric transmission line construction that are solely attributable to the listing of the species. The incremental section quantifies the impacts of the Sunrise Powerlink project that are solely attributable to the critical habitat designation.

### 7.1 PRE-DESIGNATION BASELINE IMPACTS

205. In 2000, a formal section 7 consultation addressed a fiber optic cable installation by Level 3 Communications in the North Santa Rosa Mountains (Unit 2A). The construction of four miles of the cable corridor posed risks of disturbing bighorn sheep populations. Quantified impacts from conservation efforts to protect the bighorn sheep during this construction were related to species sensitivity training, monitoring by biologists, and administrative time.
206. The Federally listed species sensitivity training courses were designed to familiarize the construction staff with Federally listed species that they could come into contact with. This education program taught about species distribution, general behavior and ecology, sensitivity to human activities, legal protection and statutes, penalties for law violations,

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<sup>124</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Designation of Habitat for the Peninsular Bighorn Sheep and Proposed Taxonomic Revision; Proposed Rule, October 10, 2007.

reporting requirements, and project protective measures. The costs for these courses totaled \$50,000.<sup>125</sup>

207. Biological monitoring costs were an estimated \$80,000.<sup>126</sup> Biologists were also employed to conduct minor impact assessment surveys, on-site monitoring and species relocation efforts when necessary.<sup>127</sup>
208. A field contact representative was also hired to oversee the compliance issues associated with the bighorn sheep. This representative handled all administrative tasks associated with compliance and served as the contact person for regulatory agencies. The wages of this field contact representative are estimated at \$30 per hour, and there were an estimated 10 hours of work required for every mile of corridor.<sup>128</sup> For the four miles of the fiber optic cable corridor, these costs totaled \$1,200.
209. There were also several conservation efforts that were performed that are not easily quantified given publicly available data. These efforts included reducing the amount of exotic species vegetation cover, exotic plant control during re-vegetation of disturbed areas, reduction of herbicide use, adherence to a storm water pollution prevention plan, and limiting the construction of paved or dirt roads.
210. The pre-designation impacts of utility construction are presented in Exhibit 7-1. As noted, the impacts were only in the South Santa Rosa unit (Unit 3).

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<sup>125</sup> Project costs cited by Representative for Sunrise Powerlink, December 7, 2007. Costs applied to pre-designation baseline due to insufficient information cited by Level 3. Application of this cost assumes a standard market value for species sensitivity training courses.

<sup>126</sup> Personal communication with Biologist, BLM, Central Desert District Office, December 13, 2007.

<sup>127</sup> U.S Fish and Wildlife Service, "Biological Opinion on the Level 3 Long Haul Fiber Optic Network, San Diego and Imperial Counties," September 18, 2000.

<sup>128</sup> Project costs cited by Representative for Sunrise Powerlink, December 7, 2007. Costs applied to pre-designation baseline due to insufficient information cited by Level 3. Application of this cost assumes a standard market wage for field contact representatives..

## EXHIBIT 7-1 PRE-DESIGNATION UTILITY CONSTRUCTION AND MAINTENANCE IMPACTS

UNIT	PRESENT VALUE 3% DISCOUNT RATE	PRESENT VALUE 7% DISCOUNT RATE
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$191,000	\$259,000
3. Carrizo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$191,000</b>	<b>\$259,000</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>		
1. San Jacinto Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan		

## 7.2 POST-DESIGNATION BASELINE IMPACTS

211. San Diego Gas and Electric (SDG&E) is a public utility regulated by the California Public Utilities Commission (CPUC) that provides electric services to three million customers in the San Diego area. SDG&E has proposed the Sunrise Powerlink Project in order for them to provide more reliable service and provide access to renewable energy sources to 650,000 customers. The Sunrise Project consists of new transmission lines to be constructed between Imperial Valley and the greater San Diego area. The Project is comprised of four “Links”, each of which are defined by geographical area and include the Desert Link, Central Link, Inland Valley Link, and Coastal Link. SDG&E proposes to begin construction between 2010 and 2020; a project initiation date of 2015, is assumed in this analysis.
212. The Sunrise Powerlink proposal would locate the Desert Link on Anza-Borrego State Park through the Southern Santa Rosa Mountains unit (Unit 2B). The Desert Link encompasses a 500 kV transmission line from an existing Imperial Valley Substation to the western boundary of the Anza-Borrego State Park.
213. Post-designation baseline costs associated with biological monitoring are \$80,000.<sup>129</sup> These impacts are attributable to baseline costs due to the fact that monitoring is conducted for all Federally listed species, and occurs regardless of a critical habitat

<sup>129</sup> Personal communication with Representative for Sunrise Powerlink Project, December 6, 2007.

designation. Total post-designation baseline costs associated with a species sensitivity program and worker training are \$50,000.<sup>130</sup> This cost is attributable to the baseline scenario due to the fact that this is recommended for Federally listed species as well, and the program content is not limited to the geographic scope outlined in the critical habitat designation.

214. Administrative time to address compliance issues by the field contact representative is valued at \$30 per hour.<sup>131</sup> An estimated 10 hours of work is required for every mile of corridor that requires consideration of potential impacts to bighorn sheep.<sup>132</sup> A Sunrise Powerlink representative estimates that regardless of critical habitat, about 10 miles of the transmission corridor will involve addressing bighorn-related issues.<sup>133</sup> Thus, post-designation baseline administrative costs are estimated to total \$3,000. One formal section 7 consultation is predicted regarding the Sunrise Powerlink,<sup>134</sup> and a portion of those costs are attributable to the post-designation baseline scenario.
215. Exhibit 7-2 displays the post-designation baseline impacts for utility construction activities.

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<sup>130</sup> Ibid.

<sup>131</sup> Ibid.

<sup>132</sup> Ibid.

<sup>133</sup> Ibid.

<sup>134</sup> Personal communication with Biologist, BLM, El Centro Office, December 10, 2007.

## EXHIBIT 7-2 POST-DESIGNATION BASELINE UTILITY CONSTRUCTION AND MAINTENANCE IMPACTS

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1	\$0	\$0	\$0	\$0
2A	\$0	\$0	\$0	\$0
2B	\$120,000	\$91,900	\$8,070	\$8,680
3	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$120,000</b>	<b>\$91,900</b>	<b>\$8,070</b>	<b>\$8,680</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
2A	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1	\$0	\$0	\$0	\$0
2A	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				

**7.3 INCREMENTAL IMPACTS**

216. SDG&E has proposed preferred and alternative routes for the Desert Link of the Sunrise Project. The preferred route crosses through the South Santa Rosa Mountains and the alternative route crosses through the Mountains a few miles north of the preferred route. Although both of the routes cross Anza-Borrego State Park and the proposed critical habitat Unit 2B (South Santa Rosa Mountains) the 12 miles of the preferred route overlaps the critical habitat, while only 5 miles of the alternative route overlaps the critical habitat.<sup>135</sup> Each scenario incurs different conservation impacts based on the amount of critical habitat that they overlap. These impacts are incremental impacts because they will only be incurred in the event of a critical habitat designation.
217. Sunrise Powerlink estimates the probability of executing their preferred route as 0.8, while the probability of their alternative route is 0.2.<sup>136</sup> This probability figure does not include the multiple alternatives proposed by the CPUC, as the alternatives are currently being revised. The CPUC was unable to comment about additional alternatives. Since the route that the power line will follow is currently unknown, the weighted average of conservation impacts is estimated in this analysis.

<sup>135</sup> Estimates derived using GIS.

<sup>136</sup> Personal communication with Representative for Sunrise Powerlink Project, December 6, 2007.

218. A Sunrise Powerlink Representative cited that for every mile of critical habitat, five hours of administrative time spent by a field contact representative would be necessary to address compliance and regulatory issues specifically associated with critical habitat designation.<sup>137</sup> Using this estimate, the preferred route will require 60 hours of administrative time and the alternative route will require 25. Administrative time to address compliance issues by the field contact representative is valued at \$30 per hour.<sup>138</sup> For each route, this wage is multiplied by the predicted hours spent and then adjusted for the corresponding probability of that route. The values for both routes are summed to find the weighted average of administrative time for both scenarios. Using this methodology, the value of administrative time of a field contact representative is \$1,590.
219. Incremental conservation impacts from the Sunrise Powerlink project are from the portion of the predicted formal section 7 consultation that considers critical habitat. Exhibit 7-3 displays the incremental impacts of the critical habitat designation on utility construction activities. There are no forecasted impacts for the areas proposed for or considered for exclusion. The impacts forecast are due to additional administrative costs to address critical habitat issues.

**EXHIBIT 7-3 INCREMENTAL UTILITY CONSTRUCTION AND MAINTENANCE IMPACTS**

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1	\$0	\$0	\$0	\$0
2A	\$0	\$0	\$0	\$0
2B	\$5,260	\$4,030	\$354	\$380
3	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$5,260</b>	<b>\$4,030</b>	<b>\$354</b>	<b>\$380</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
2A	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1	\$0	\$0	\$0	\$0
2A	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Notes: Totals may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				

<sup>137</sup> Ibid.

<sup>138</sup> Ibid.

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## APPENDIX A | SMALL BUSINESS ANALYSIS AND ENERGY IMPACTS ANALYSIS

1. This appendix considers the extent to which incremental impacts from critical habitat designation could be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted in the development of the economic analysis. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.
2. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts associated with the proposed critical habitat designation, and not the post-designation baseline impacts of bighorn sheep conservation. The incremental impacts of the rulemaking are considered most relevant for the small business and energy impacts analyses as they are expected to stem from the critical habitat designation, and are therefore not expected to occur in the case that critical habitat is not designated for the bighorn sheep. The post-designation baseline impacts associated with the listing of the bighorn sheep, as quantified in Chapters 2 through 7 of this report, are expected to occur regardless of the outcome of this rulemaking and are therefore not considered in terms of their impacts on small businesses and the energy industry.

### A.1 SBREFA ANALYSIS

3. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).<sup>139</sup> No initial regulatory flexibility analysis (IRFA) is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for bighorn sheep conservation efforts to affect small entities.
4. To ensure broad consideration of impacts on small entities, the Service has prepared this small business analysis without first making the threshold determination whether the

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<sup>139</sup> 5 U.S.C. § 601 et seq.

proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities.

#### A.1.1 SUMMARY OF IMPACTS TO SMALL ENTITIES

5. This screening analysis is based on the estimated incremental impacts associated with the proposed rulemaking as described in Chapters 2 through 7 of this analysis. The analysis evaluates the potential for economic impacts related to the following activity categories:

- Species Management
- Development
- Mining
- Recreation
- Transportation
- Utilities Construction and Management

This analysis concludes that there are no incremental impacts resulting from this rulemaking that may be borne by small businesses.

#### A.1.2 DETAILED ANALYSIS OF IMPACTS TO SMALL BUSINESSES

6. This analysis is intended to improve the Service's understanding of the potential effects of the proposed rule on small entities, and to identify opportunities to minimize these impacts in the final rulemaking. The Endangered Species Act (Act) requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular areas as critical habitat." The Secretary's discretion is limited as (s)he may not exclude areas if so doing "will result in the extinction of the species."
7. Three types of small entities are defined in the RFA:
  - Small Business - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The U.S. Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
  - Small Governmental Jurisdiction - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special

districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.

- Small Organization - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
8. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.<sup>140</sup>
  9. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency (EPA)* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.<sup>141</sup> The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
  10. The Small Business Administration (SBA) in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.<sup>142</sup> "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities

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<sup>140</sup> 773 F. 2d 327 (D.C. Cir. 1985).

<sup>141</sup> 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

<sup>142</sup> Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 20.



even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body.”<sup>143</sup>

11. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity.
12. This screening analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapters 2 through Chapter 7 of this economic analysis. Although businesses affected indirectly are considered, this analysis considers only those entities for which impact would not be measurably diluted. This analysis concludes that there are no incremental impacts associated with this rulemaking. Incremental impacts stemming from various species conservation and development control that are expected to be borne by the Agua Caliente Tribe are not included in this screening analysis because the Tribe is not a small entity. Although there will be potential incremental impacts borne by SDG&E for the Sunrise Powerlink project, and by TXI Creole Corporation, both these companies are not small businesses. Therefore, Exhibit A-2 shows no potential incremental impacts to small businesses resulting from conservation efforts in any of the four proposed critical habitat units.

## **A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY**

13. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”<sup>144</sup>

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<sup>143</sup> *Ibid.*, pg. 21.

<sup>144</sup> Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

## EXHIBIT A-2 SUMMARY OF INCREMENTAL IMPACTS TO SMALL ENTITIES BY UNIT

UNIT	PRESENT VALUE 3%	PRESENT VALUE 7%	ANNUALIZED 3%	ANNUALIZED 7%
<b>PROPOSED CRITICAL HABITAT</b>				
2B	\$0	\$0	\$0	\$0
3	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION<sup>1</sup></b>				
1	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION<sup>2</sup></b>				
1 (20 years)	\$0	\$0	\$0	\$0
2A (20 years)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
1 (30 years)	\$0	\$0	\$0	\$0
2A (30 years)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Notes: Values in tables may not sum due to rounding. (1) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan. (2) Areas considered for exclusion include land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan				

14. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
  - Reductions in fuel production in excess of 4,000 barrels per day;
  - Reductions in coal production in excess of 5 million tons per year;
  - Reductions in natural gas production in excess of 25 million Mcf per year;
  - Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
  - Increases in energy use required by the regulatory action that exceed the thresholds above;
  - Increases in the cost of energy production in excess of one percent;
  - Increases in the cost of energy distribution in excess of one percent; or

- Other similarly adverse outcomes.<sup>145</sup>

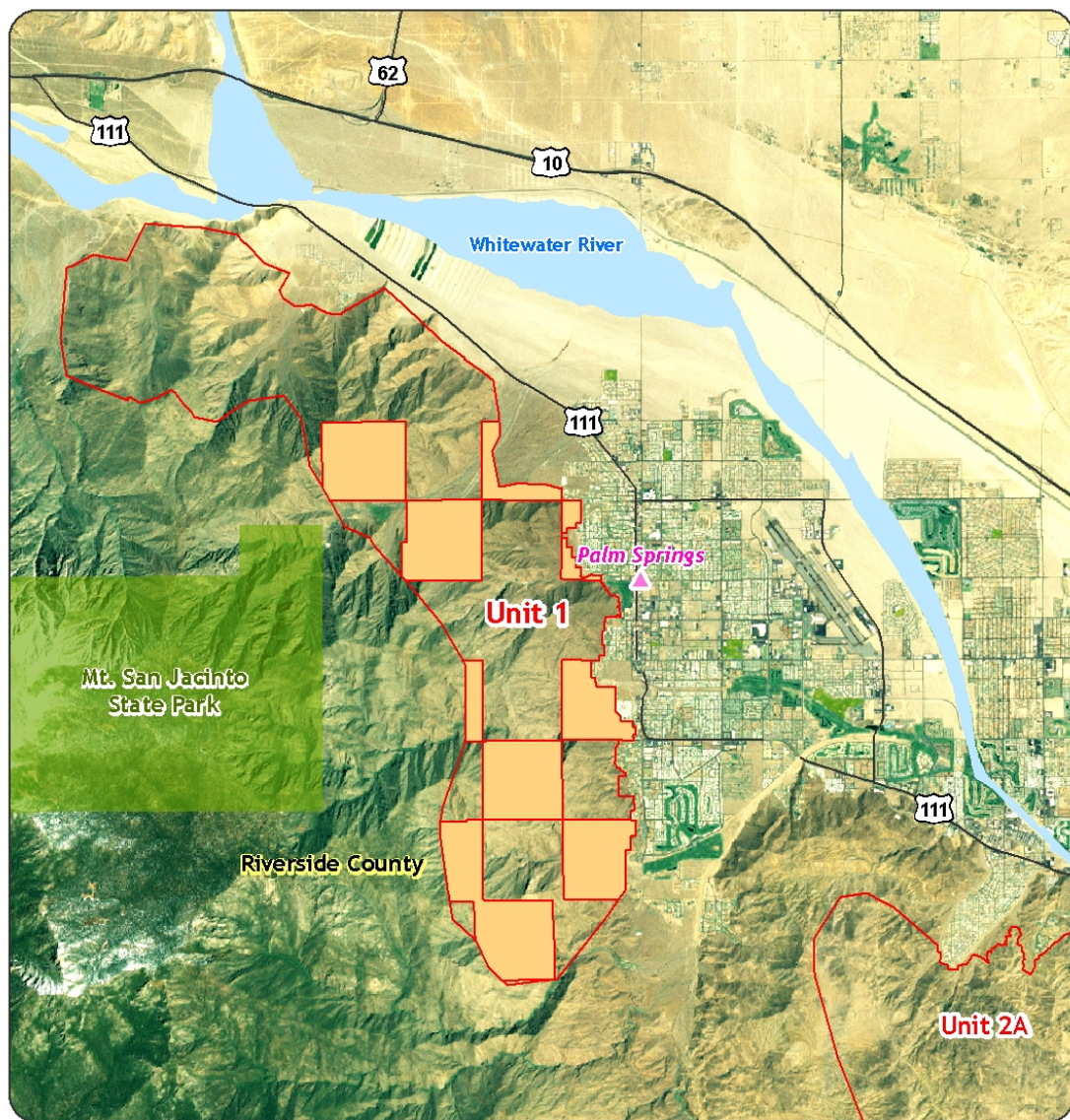
15. Sunrise Powerlink is the only entity involved in the production of energy. Although Sunrise Powerlink is likely to incur incremental bighorn sheep conservation costs, these costs are not expected to be sufficient to be noted as a “significant adverse effect”. Over the next 20 years, Sunrise Powerlink is forecast to incur total expenses of \$4,030, discounted at seven percent. These impacts are not sufficient to reduce electricity production appreciably, or to increase the cost of energy production or delivery by more than one percent. Thus, the incremental impacts associated with critical habitat designation for the Bighorn are unlikely to be of sufficient magnitude to affect energy production or delivery.

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<sup>145</sup> Ibid.

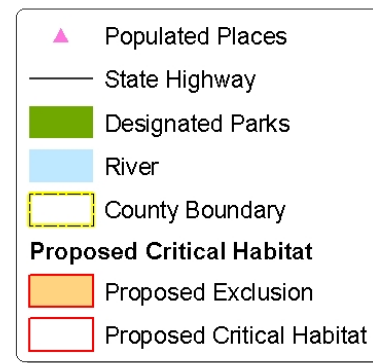
## APPENDIX B

### STUDY AREA MAPS



## Proposed Critical Habitat for Peninsular Bighorn Sheep

### Unit 1



0 25 50 100  
Miles

#### Source:

1. US Fish and Wildlife Service, Ventura, California, USA
2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA

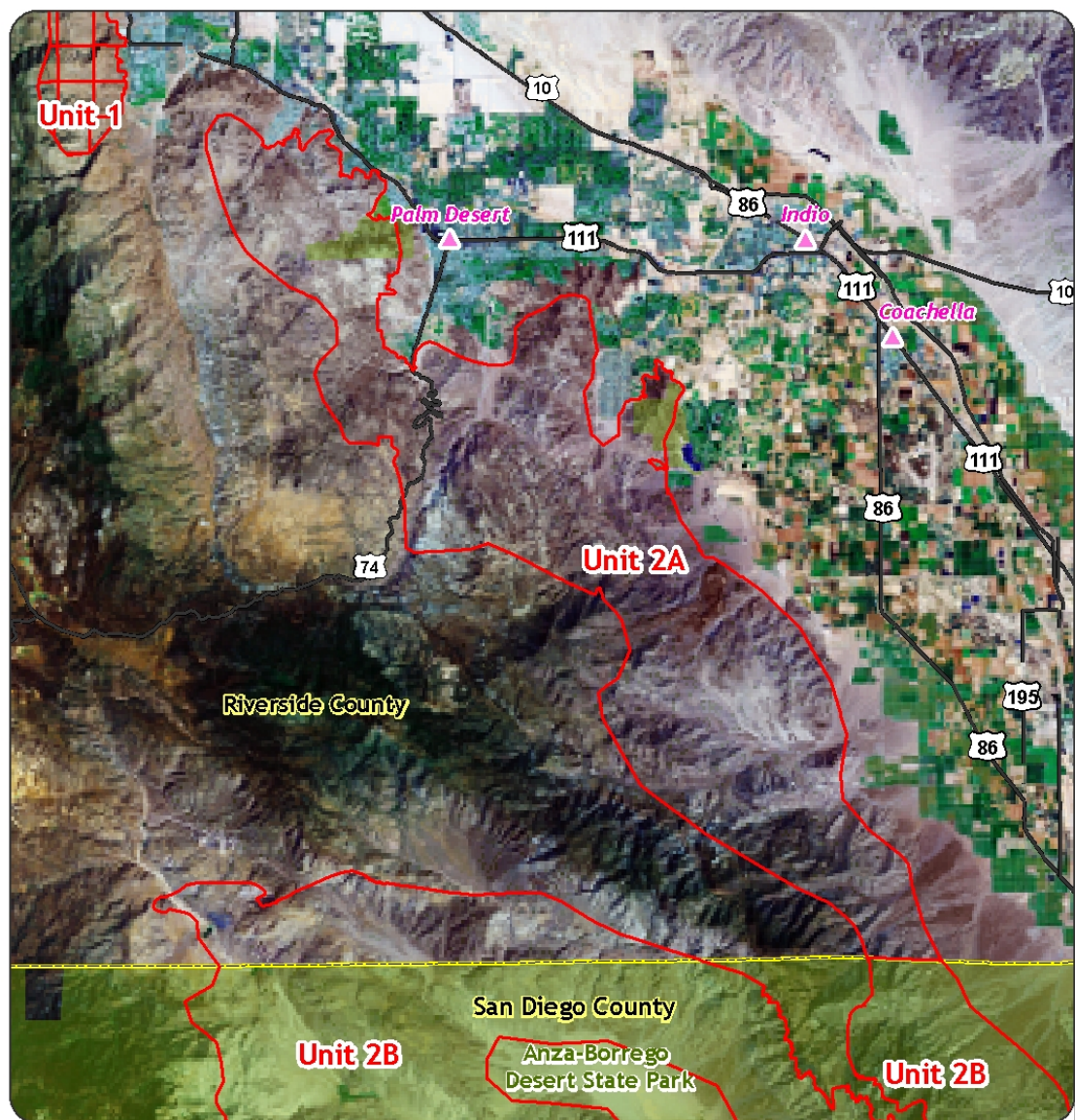
0 1 2  
Miles

IEC



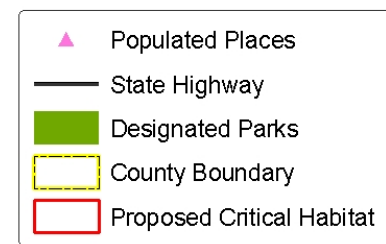
INDUSTRIAL ECONOMICS, INCORPORATED





## Proposed Critical Habitat for Peninsular Bighorn Sheep

### Unit 2A



#### Source:

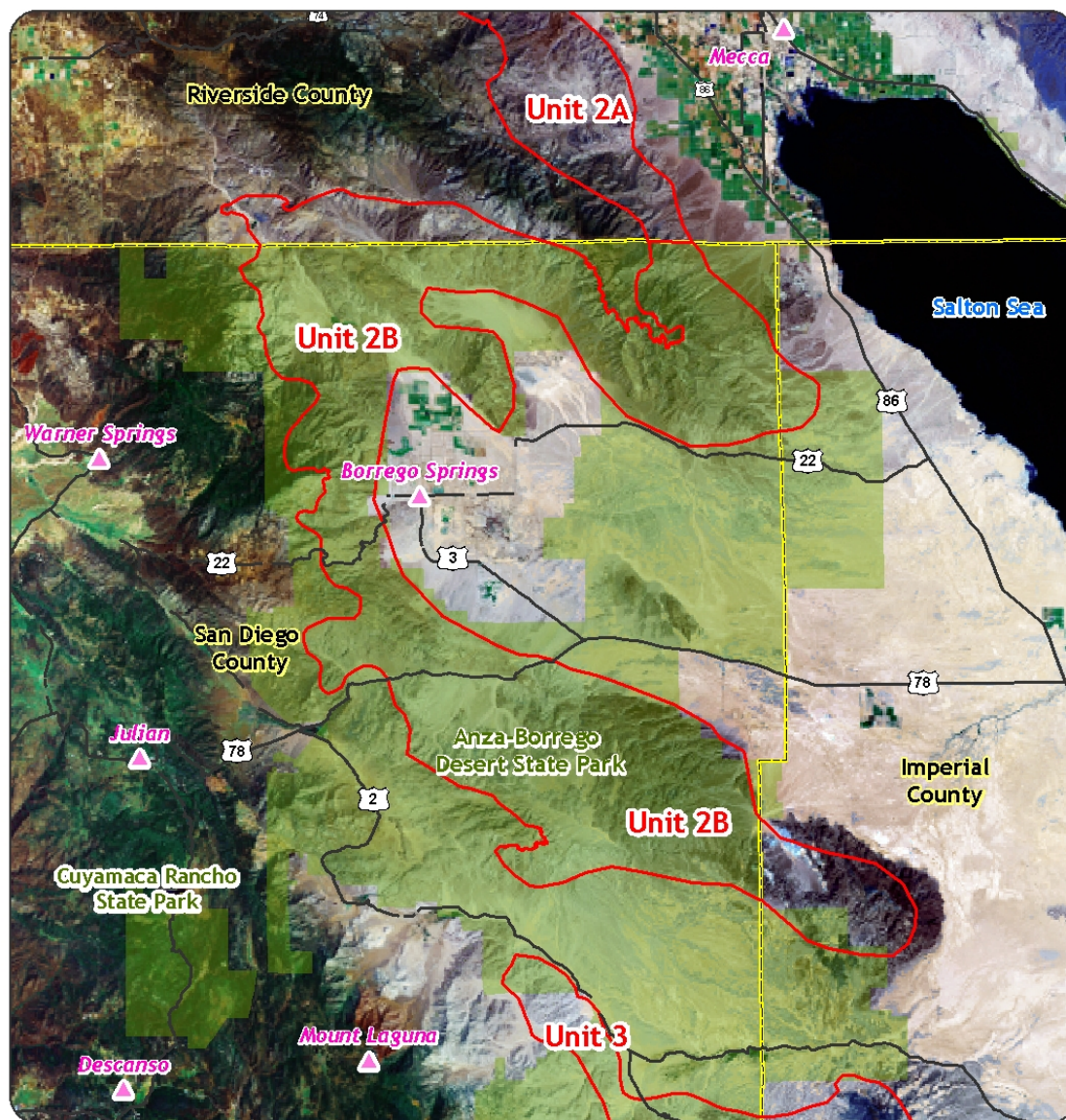
1. US Fish and Wildlife Service, Ventura, California, USA
2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA

IEC

INDUSTRIAL ECONOMICS, INCORPORATED

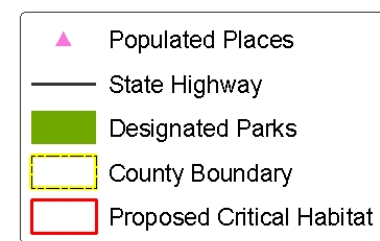






## Proposed Critical Habitat for Peninsular Bighorn Sheep

### Unit 2B



#### Source:

1. US Fish and Wildlife Service, Ventura, California, USA
2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA

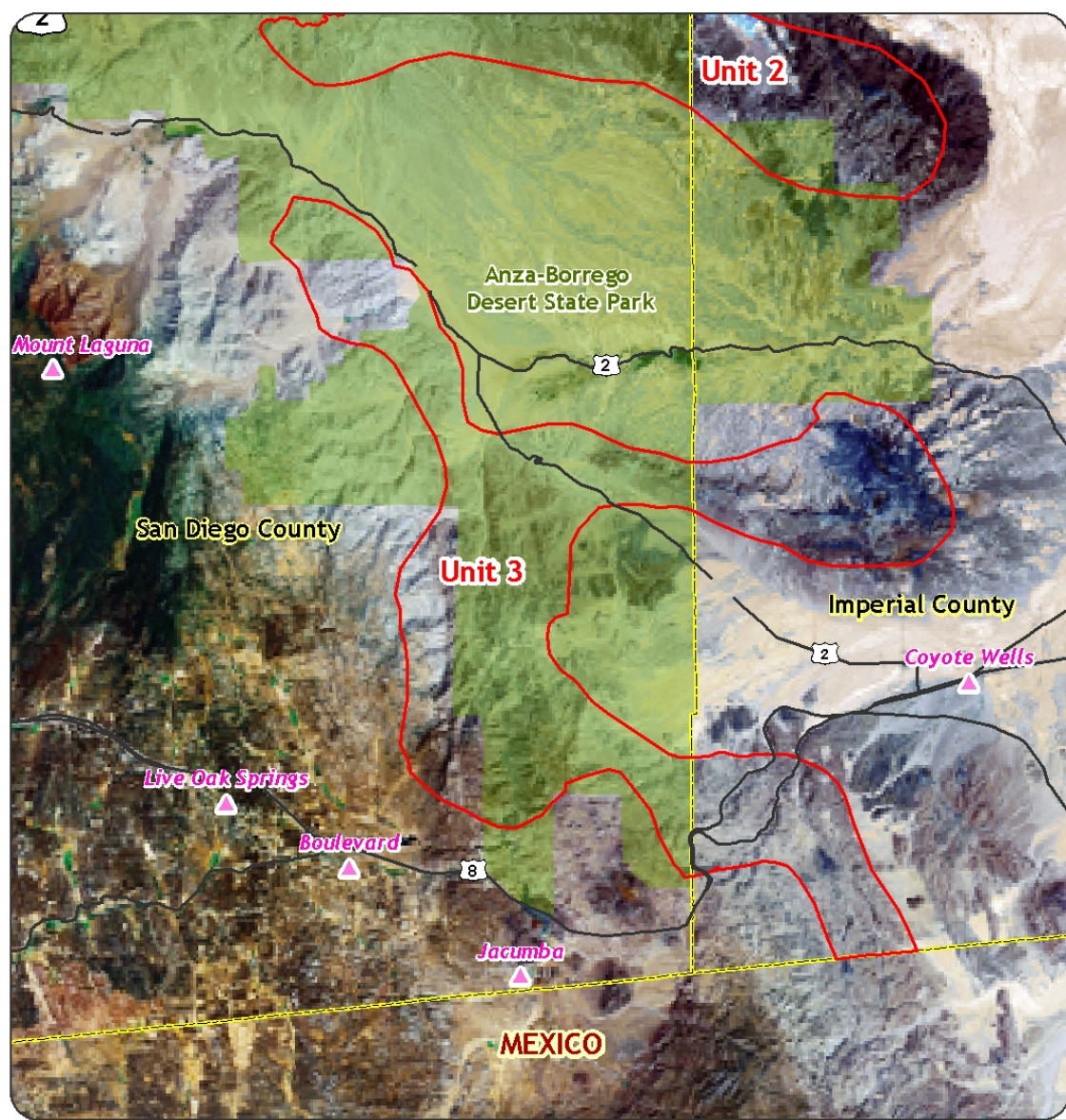
0 2.5 5 Miles

IEc

INDUSTRIAL ECONOMICS, INCORPORATED





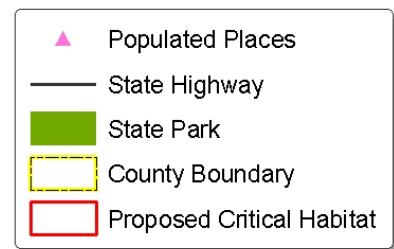


**Source:**

1. US Fish and Wildlife Service, Ventura, California, USA
2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA

## Proposed Critical Habitat for Peninsular Bighorn Sheep

### Unit 3



0 25 50 100  
Miles

**IEc**



**INDUSTRIAL ECONOMICS, INCORPORATED**



**APPENDIX C DETAILED IMPACTS TO ACTIVITIES BY UNIT**

Appendix C provides detailed tables for impacts discussed in the chapters. Net present values of streams of impacts are provided at three and seven percent discount rates.

**Calculating Present Value and Annualized Impacts**

For each land use activity, this analysis presents economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of the economic impacts of past or future impacts to present value terms requires the following: a) past or projected future impacts of species conservation efforts; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts ( $PV_c$ ) of bighorn sheep conservation efforts from year  $t$  to  $T$  is measured in 2008 dollars according to the following standard formula:<sup>a</sup>

$$PV_c = \sum_{t=t_0}^{t=T} \frac{C_t}{(1+r)^{t-2008}}$$

$C_t$  = cost of species conservation efforts in year  $t$

$r$  = discount rate<sup>b</sup>

Impacts of conservation efforts for each land use activity in each unit are also expressed as annualized values (i.e., the series of equal annual costs over some defined time period that have the same present value as estimated total impacts). Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods ( $T$ ). This analysis employs a forecast period of 20 years, 2008 through 2027. Annualized impacts of future bighorn sheep conservation efforts ( $APV_c$ ) are calculated using the following standard formula:

$$APV_c = PV_c \left[ \frac{r}{1 - (1+r)^{-(N)}} \right]$$

$N$  = number of years in the forecast period

<sup>a</sup> To derive the present value of pre-designation conservation efforts for this analysis,  $t$  is 1998 and  $T$  is 2007; to derive the present value of post-designation conservation efforts,  $t$  is 2008 and  $T$  is 2027. For the case of post-designation land acquisition in the Coachella MS HCP, where land acquisition can be definitively predicted,  $t$  is 2008 and  $T$  is 2037; in this one case it is reasonable to predict a 30 year time frame.

<sup>b</sup> To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

For all tables in this appendix, the following notes apply:

- (1) Totals may not sum due to rounding.
- (2) Areas proposed for exclusion include land to be managed under the Agua Caliente Band of Cahuilla Indians Habitat Conservation Plan.
- (3) Areas considered for exclusion include private land, as well as California Department of Fish and Game, and U.S. Department of Interior, Bureau of Land Management land to be managed under the Coachella Valley Multiple Species Habitat Conservation Plan.

**EXHIBIT C-1. DETAILED IMPACTS TO ALL ACTIVITIES - PRE-DESIGNATION  
BASELINE IMPACTS (1998 - 2007)**

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$21,400	\$25,300
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$848,000	\$1,090,000
3. Carrizo Canyon	\$2,550,000	\$2,840,000
<b>TOTAL</b>	<b>\$3,420,000</b>	<b>\$3,960,000</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$598,000	\$658,000
<b>TOTAL</b>	<b>\$598,000</b>	<b>\$658,000</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$39,000	\$45,700
2A. North Santa Rosa Mountains	\$13,600,000	\$15,900,000
<b>TOTAL</b>	<b>\$13,600,000</b>	<b>\$16,000,000</b>

## EXHIBIT C-2. POST-DESIGNATION BASELINE IMPACTS TO ALL ACTIVITIES (2008 - 2037)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$37,900	\$28,100	\$2,550	\$2,650
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$30,700,000	\$22,700,000	\$2,060,000	\$2,140,000
3. Carrizo Canyon	\$61,700,000	\$44,700,000	\$4,150,000	\$4,210,000
<b>TOTAL</b>	<b>\$92,500,000</b>	<b>\$67,400,000</b>	<b>\$6,220,000</b>	<b>\$6,360,000</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$499,000	\$369,000	\$33,500	\$34,800
<b>TOTAL</b>	<b>\$499,000</b>	<b>\$369,000</b>	<b>\$33,500</b>	<b>\$34,800</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains (20 years)	\$4,920,000	\$3,640,000	\$330,000	\$343,000
2A.North Santa Rosa Mountains (20 years)	\$68,700,000	\$51,000,000	\$4,620,000	\$4,810,000
<b>TOTAL</b>	<b>\$73,600,000</b>	<b>\$54,600,000</b>	<b>\$4,950,000</b>	<b>\$5,150,000</b>
1. San Jacinto Mountains (30 years)	\$5,790,000	\$3,990,000	\$330,000	\$343,000
2A.North Santa Rosa Mountains (30 years)	\$80,500,000	\$55,700,000	\$4,620,000	\$4,810,000
<b>TOTAL</b>	<b>\$86,300,000</b>	<b>\$59,700,000</b>	<b>\$4,950,000</b>	<b>\$5,150,000</b>

## EXHIBIT C-3. INCREMENTAL IMPACTS - ALL ACTIVITIES (2008 - 2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$5,260	\$4,030	\$354	\$380
3. Carrizo Canyon	\$405,000	\$302,000	\$27,200	\$28,500
<b>TOTAL</b>	<b>\$411,000</b>	<b>\$306,000</b>	<b>\$27,600</b>	<b>\$28,900</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$11,300,000	\$8,310,000	\$758,000	\$785,000
<b>TOTAL</b>	<b>\$11,300,000</b>	<b>\$8,310,000</b>	<b>\$758,000</b>	<b>\$785,000</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$2,440	\$2,440	\$164	\$230
2A.North Santa Rosa Mountains	\$6,410	\$5,480	\$431	\$517
<b>TOTAL</b>	<b>\$8,850</b>	<b>\$7,920</b>	<b>\$595</b>	<b>\$747</b>

## EXHIBIT C-4. PRE-DESIGNATION IMPACTS TO SPECIES AND HABITAT MANAGEMENT ACTIVITIES (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$21,400	\$25,300
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$587,000	\$739,000
3. Carrizo Canyon	\$398,000	\$503,000
<b>TOTAL</b>	<b>\$1,010,000</b>	<b>\$1,270,000</b>
<b>Proposed FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$598,000	\$658,000
<b>TOTAL</b>	<b>\$598,000</b>	<b>\$658,000</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$24,100	\$30,200
2A. North Santa Rosa Mountains	\$5,060,000	\$6,320,000
<b>TOTAL</b>	<b>\$5,090,000</b>	<b>\$6,350,000</b>

## EXHIBIT C-5. POST-DESIGNATION BASELINE IMPACTS TO SPECIES MANAGEMENT (2008-2037)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$37,900	\$28,100	\$2,550	\$2,650
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$1,030,000	\$759,000	\$69,200	\$71,700
3. Carrizo Canyon	\$813,000	\$604,000	\$54,600	\$57,000
<b>TOTAL</b>	<b>\$1,880,000</b>	<b>\$1,390,000</b>	<b>\$126,000</b>	<b>\$131,000</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$499,000	\$369,000	\$33,500	\$34,800
<b>TOTAL</b>	<b>\$499,000</b>	<b>\$369,000</b>	<b>\$33,500</b>	<b>\$34,800</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains (20 years)	\$2,790,000	\$2,060,000	\$187,000	\$195,000
2A.North Santa Rosa Mountains (20 years)	\$44,000,000	\$32,500,000	\$2,960,000	\$3,070,000
<b>TOTAL</b>	<b>\$46,800,000</b>	<b>\$34,600,000</b>	<b>\$3,140,000</b>	<b>\$3,270,000</b>
1. San Jacinto Mountains (30 years)	\$3,660,000	\$2,410,000	\$187,000	\$195,000
2A.North Santa Rosa Mountains (30 years)	\$55,800,000	\$37,300,000	\$2,960,000	\$3,070,000
<b>TOTAL</b>	<b>\$59,500,000</b>	<b>\$39,700,000</b>	<b>\$3,140,000</b>	<b>\$3,270,000</b>

## EXHIBIT C-6. POST-DESIGNATION INCREMENTAL IMPACTS TO SPECIES MANAGEMENT (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$398,000	\$294,000	\$26,800	\$27,800
<b>TOTAL</b>	<b>\$398,000</b>	<b>\$294,000</b>	<b>\$26,800</b>	<b>\$27,800</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$8,860,000	\$6,530,000	\$595,000	\$616,000
<b>TOTAL</b>	<b>\$8,860,000</b>	<b>\$6,530,000</b>	<b>\$595,000</b>	<b>\$616,000</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$2,440	\$2,440	\$164	\$230
2A. North Santa Rosa Mountains	\$2,440	\$2,440	\$164	\$230
<b>TOTAL</b>	<b>\$4,880</b>	<b>\$4,880</b>	<b>\$328</b>	<b>\$461</b>

## EXHIBIT C-7. PRE-DESIGNATION IMPACTS TO DEVELOPMENT (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0
3. Carrizo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$14,900	\$15,500
2A. North Santa Rosa Mountains	\$7,310,000	\$8,230,000
<b>TOTAL</b>	<b>\$7,330,000</b>	<b>\$8,250,000</b>



## EXHIBIT C-8. POST-DESIGNATION BASELINE IMPACTS TO DEVELOPMENT (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$29,400,000	\$21,800,000	\$1,980,000	\$2,060,000
3. Carrizo Canyon	\$35,800,000	\$26,500,000	\$2,400,000	\$2,500,000
<b>TOTAL</b>	<b>\$65,200,000</b>	<b>\$48,200,000</b>	<b>\$4,380,000</b>	<b>\$4,550,000</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$2,130,000	\$1,580,000	\$143,000	\$149,000
2A.North Santa Rosa Mountains	\$15,300,000	\$11,300,000	\$1,030,000	\$1,070,000
<b>TOTAL</b>	<b>\$17,500,000</b>	<b>\$12,900,000</b>	<b>\$1,170,000</b>	<b>\$1,220,000</b>

## EXHIBIT C-9. POST-DESIGNATION INCREMENTAL IMPACTS TO DEVELOPMENT (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$2,410,000	\$1,780,000	\$162,000	\$168,000
<b>TOTAL</b>	<b>\$2,410,000</b>	<b>\$1,780,000</b>	<b>\$162,000</b>	<b>\$168,000</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A.North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-10. PRE-DESIGNATION IMPACTS TO RECREATION (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$70,800	\$88,700
3. Carrizo Canyon	\$2,070,000	\$2,240,000
<b>TOTAL</b>	<b>\$2,140,000</b>	<b>\$2,330,000</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$1,180,000	\$1,320,000
<b>TOTAL</b>	<b>\$1,180,000</b>	<b>\$1,320,000</b>

## EXHIBIT C-11. POST-DESIGNATION BASELINE IMPACTS TO RECREATION (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$91,900	\$68,000	\$6,180	\$6,420
3. Carrizo Canyon	\$5,980,000	\$4,420,000	\$402,000	\$417,000
<b>TOTAL</b>	<b>\$6,070,000</b>	<b>\$4,490,000</b>	<b>\$408,000</b>	<b>\$424,000</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$3,230,000	\$2,390,000	\$217,000	\$226,000
<b>TOTAL</b>	<b>\$3,230,000</b>	<b>\$2,390,000</b>	<b>\$217,000</b>	<b>\$226,000</b>

## EXHIBIT C-12. POST-DESIGNATION INCREMENTAL IMPACTS TO RECREATION (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-13. PRE-DESIGNATION IMPACTS TO MINING (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0
3. Carrizo Canyon	\$79,200	\$98,400
<b>TOTAL</b>	<b>\$79,200</b>	<b>\$98,400</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-14. POST-DESIGNATION BASELINE IMPACTS TO MINING (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$19,200,000	\$13,200,000	\$1,290,000	\$1,240,000
<b>TOTAL</b>	<b>\$19,200,000</b>	<b>\$13,200,000</b>	<b>\$1,290,000</b>	<b>\$1,240,000</b>
<b>Proposed FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-15. POST-DESIGNATION INCREMENTAL IMPACTS TO MINING (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$4,880	\$4,880	\$328	\$461
<b>TOTAL</b>	<b>\$4,880</b>	<b>\$4,880</b>	<b>\$328</b>	<b>\$461</b>
<b>Proposed FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>



## EXHIBIT C-16. PRE-DESIGNATION IMPACTS TO TRANSPORTATION (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0
3. Carrizo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$39,500	\$44,200
<b>TOTAL</b>	<b>\$39,500</b>	<b>\$44,200</b>

## EXHIBIT C-17. POST-DESIGNATION BASELINE IMPACTS TO TRANSPORTATION (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$7,130	\$7,130	\$479	\$673
<b>TOTAL</b>	<b>\$7,130</b>	<b>\$7,130</b>	<b>\$479</b>	<b>\$673</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$6,110,000	\$4,680,000	\$411,000	\$442,000
<b>TOTAL</b>	<b>\$6,110,000</b>	<b>\$4,680,000</b>	<b>\$411,000</b>	<b>\$442,000</b>

## EXHIBIT C-18. POST-DESIGNATION INCREMENTAL IMPACTS TO TRANSPORTATION (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$0	\$0	\$0	\$0
3. Carrizo Canyon	\$2,380	\$2,380	\$160	\$225
<b>TOTAL</b>	<b>\$2,380</b>	<b>\$2,380</b>	<b>\$160</b>	<b>\$225</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$3,970	\$3,040	\$267	\$287
<b>TOTAL</b>	<b>\$3,970</b>	<b>\$3,040</b>	<b>\$267</b>	<b>\$287</b>

## C-19. PRE-DESIGNATION IMPACTS TO UTILITIES CONSTRUCTION ACTIVITIES (1998-2007)

UNIT	PRESENT VALUE	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
2B. South Santa Rosa Mountains	\$191,000	\$259,000
3. Carrizo Canyon	\$0	\$0
<b>TOTAL</b>	<b>\$191,000</b>	<b>\$259,000</b>
<b>PROPOSED FOR EXCLUSION</b>		
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>		
1. San Jacinto Mountains	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-20. POST-DESIGNATION BASELINE IMPACTS TO UTILITIES CONSTRUCTION ACTIVITIES (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$120,000	\$91,900	\$8,070	\$8,680
3. Carrizo Canyon	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$120,000</b>	<b>\$91,900</b>	<b>\$8,070</b>	<b>\$8,680</b>
<b>PROPOSED FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## EXHIBIT C-21. POST-DESIGNATION INCREMENTAL IMPACTS TO UTILITIES CONSTRUCTION ACTIVITIES (2008-2027)

UNIT	PRESENT VALUE		ANNUALIZED IMPACTS	
	DISCOUNTED AT 3%	DISCOUNTED AT 7%	DISCOUNTED AT 3%	DISCOUNTED AT 7%
<b>PROPOSED CRITICAL HABITAT</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
2B. South Santa Rosa Mountains	\$5,260	\$4,030	\$354	\$380
3. Carrizo Canyon	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$5,260</b>	<b>\$4,030</b>	<b>\$354</b>	<b>\$380</b>
<b>Proposed FOR EXCLUSION</b>				
1. San Jacinto Mountains (Tribal HCP)	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSIDERED FOR EXCLUSION</b>				
1. San Jacinto Mountains	\$0	\$0	\$0	\$0
2A. North Santa Rosa Mountains	\$0	\$0	\$0	\$0
<b>TOTAL</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## APPENDIX D UNDISCOUNTED STREAM OF IMPACTS BY ACTIVITY

This appendix provides details of the undiscounted impacts by year for each unit by activity. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”<sup>146</sup> For this analysis, this applies to the cost estimates for future years. Circular A-4 directs that future estimates of value should be presented in undiscounted terms. This is an important way to clarify future costs. For example, if a program will cost \$10,000 ten years in the future, that future cost estimate should be noted as such to clarify what the cost estimate is in that year.

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<sup>146</sup> Office of Management and Budget, *Circular A-4*, September 17, 2003, p. 18). The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index. See footnote 1.

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## EXHIBIT D-1. UNDISCOUNTED SPECIES MANAGEMENT IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
<b>Pre-Designation Impacts</b>							
1998	\$0	\$0	\$65,027	\$49,695	\$0	\$1,381	\$407,088
1999	\$0	\$0	\$32,527	\$17,195	\$0	\$1,381	\$407,088
2000	\$0	\$0	\$65,027	\$49,695	\$0	\$1,381	\$407,088
2001	\$3,975	\$0	\$32,527	\$17,195	\$0	\$1,381	\$438,817
2002	\$2,475	\$0	\$71,527	\$49,695	\$0	\$7,881	\$445,317
2003	\$2,475	\$0	\$32,527	\$17,195	\$0	\$1,381	\$438,817
2004	\$2,475	\$0	\$65,027	\$49,695	\$129,622	\$1,381	\$438,817
2005	\$2,475	\$0	\$32,527	\$17,195	\$132,032	\$1,381	\$438,817
2006	\$2,475	\$0	\$65,027	\$49,695	\$144,354	\$1,381	\$438,817
2007	\$2,475	\$0	\$32,527	\$17,195	\$150,187	\$1,381	\$438,817
<b>Post-Designation Impacts (Baseline)</b>							
2008	\$2,475	\$0	\$76,529	\$67,708	\$32,555	\$182,394	\$2,891,056
2009	\$2,475	\$0	\$44,029	\$35,208	\$32,555	\$182,394	\$2,886,056
2010	\$2,475	\$0	\$76,529	\$67,708	\$32,555	\$182,394	\$2,866,056
2011	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2012	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2013	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2014	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2015	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2016	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2017	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2018	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685



YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2019	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2020	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2021	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2022	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2023	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2024	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2025	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2026	\$2,475	\$0	\$84,715	\$69,383	\$32,555	\$181,600	\$2,867,685
2027	\$2,475	\$0	\$52,215	\$36,883	\$32,555	\$181,600	\$2,867,685
2028						\$180,219	\$2,428,868
2029						\$180,219	\$2,428,868
2030						\$180,219	\$2,428,868
2031						\$180,219	\$2,428,868
2032						\$180,219	\$2,428,868
2033						\$180,219	\$2,428,868
2034						\$180,219	\$2,428,868
2035						\$180,219	\$2,428,868
2036						\$180,219	\$2,428,868
2037						\$180,219	\$2,428,868
Post-Designation Impacts (Incremental)							
2008	\$0	\$0	\$0	\$25,974	\$405,969	\$2,440	\$2,440
2009	\$0	\$0	\$0	\$25,974	\$685,746	\$0	\$0
2010	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2011	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2012	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2013	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2014	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2015	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2016	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2017	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2018	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2019	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2020	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2021	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2022	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2023	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2024	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2025	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2026	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2027	\$0	\$0	\$0	\$25,974	\$583,131	\$0	\$0
2028						\$0	\$0
2029						\$0	\$0
2030						\$0	\$0
2031						\$0	\$0
2032						\$0	\$0
2033						\$0	\$0
2034						\$0	\$0
2035						\$0	\$0
2036						\$0	\$0
2037						\$0	\$0

## EXHIBIT D-2. UNDISCOUNTED DEVELOPMENT IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
<b>Pre-Designation Impacts</b>							
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$14,500
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$1,344,947
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$1,325,447
2005	\$0	\$0	\$0	\$0	\$0	\$0	\$1,344,947
2006	\$0	\$0	\$0	\$0	\$0	\$0	\$1,325,447
2007	\$0	\$0	\$0	\$0	\$0	\$14,500	\$1,325,447
<b>Post-Designation Impacts (Baseline)</b>							
2008	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2009	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2010	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2011	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2012	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2013	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2014	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2015	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2016	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2017	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2018	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2019	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2020	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2021	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2022	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2023	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2024	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2025	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2026	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
2027	\$0	\$0	\$1,921,798	\$2,334,636	\$0	\$139,020	\$1,000,876
Post-Designation Impacts (Incremental)							
2008	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2016	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2023	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$157,445	\$0	\$0

## EXHIBIT D-3. UNDISCOUNTED MINING IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
Pre-Designation Impacts							
1998	\$0	\$0	\$0	\$19,500	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$47,735	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	\$0	\$0	\$0	\$0	\$0	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
Post-Designation Impacts (Baseline)							
2008	\$0	\$0	\$0	\$19,178	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2016	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$1,532,813	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$1,586,034	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$1,586,034	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$1,586,034	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$1,586,034	\$0	\$0	\$0
Post-Designation Impacts (Incremental)							
2008	\$0	\$0	\$0	\$4,880	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0

## EXHIBIT D-4. UNDISCOUNTED RECREATION IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
<b>Pre-Designation Impacts</b>							
1998	\$0	\$0	\$6,000	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$6,000	\$0	\$0	\$0	\$19,500
2000	\$0	\$0	\$6,000	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$6,000	\$0	\$0	\$0	\$16,260
2002	\$0	\$0	\$6,000	\$0	\$0	\$0	\$16,260
2003	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$67,440
2004	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$116,260
2005	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$326,958
2006	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$314,598
2007	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
<b>Post-Designation Impacts (Baseline)</b>							
2008	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$211,698
2009	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2010	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2011	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2012	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2013	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2014	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2015	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2016	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2017	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2018	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698



YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2019	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2020	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2021	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2022	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2023	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2024	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2025	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2026	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698
2027	\$0	\$0	\$6,000	\$390,000	\$0	\$0	\$210,698

Note: No incremental impacts to recreation were estimated.

#### EXHIBIT D-5. UNDISCOUNTED TRANSPORTATION IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
<b>Pre-Designation Impacts</b>							
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$1	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$2	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$3	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$4	\$0	\$0	\$0	\$0	\$9,500

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2003	\$0	\$5	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$6	\$0	\$0	\$0	\$0	\$1,500
2005	\$0	\$7	\$0	\$0	\$0	\$0	\$5,550
2006	\$0	\$8	\$0	\$0	\$0	\$0	\$0
2007	\$0	\$9	\$0	\$0	\$0	\$0	\$19,800
Post-Designation Impacts (Baseline)							
2008	\$0	\$0	\$0	\$7,130	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$7,514,600
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Post-Designation Impacts (Incremental)							
2008	\$0	\$0	\$0	\$2,380	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$4,880
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0

## EXHIBIT D-6. UNDISCOUNTED UTILITIES IMPACTS BY UNIT

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
<b>Pre-Designation Impacts</b>							
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$150,700	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Post-Designation Impacts (Baseline)</b>							
2008	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$147,600	\$0	\$0	\$0	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Post-Designation Impacts (Incremental)							
2008	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$6,470	\$0	\$0	\$0	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0

YEAR	PROPOSED CRITICAL HABITAT				PROPOSED FOR EXCLUSION	CONSIDERED FOR EXCLUSION	
	UNIT 1	UNIT 2A	UNIT 2B	UNIT 3	UNIT 1	UNIT 1	UNIT 2A
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0